1- Oscillatory motion

*** Periodic motion: It's a motion which is regularly repeated in equal periods of time.**
*** Types of periodic motion: oscillatory motion – wave motion.**

*** Oscillatory motion: It's the motion repeated in 2 sides of rest point in equal periods of time.**
*** Examples of oscillatory motion: Pendulum – spring – tuning fork – stretched string – swing motion**

[The velocity is maximum at rest point - the velocity = zero at max. displacement]

*** Kinetic energy = 1/2 MV^2. (K.E increase by increase the velocity and vice versa)**

- Simple harmonic motion is the simplest form of oscillatory motion.

*** Motion of a rotary: it's a periodic motion: as it's repeated regularly in equal time period, but not oscillatory motion: Bec. It is not repeated on 2 sides of rest point.**

*** Properties of oscillatory motion:**

- **Amplitude: It's maximum displacement done by the oscillating body away from its rest point**
  - **Measured by: metre (m) – centimeter (cm).**
  -
- **Complete oscillation: motion of oscillating body when passes by a fixed point 2 successive times Complete oscillation includes 4 amplitudes (displacement)**

- **Periodic time: It's the time taken by oscillating body to make one complete oscillation.**
- **Measured by: second (sec).**
- **Frequency: It's the number of complete oscillations made by oscillating body in one second.**
  - **Measured by: Hertz (Hz).**

Periodic time (T) = time (sec) / no. of complete oscillations

Frequency (F) = no. of complete oscillations / time (sec)

Periodic time = 1 / Frequency **Frequency = 1 / Periodic time**

Periodic time x Frequency = 1

The relation between periodic time and frequency is inverse relation

Frequency x periodic time = 1

Kilohertz = 1 x10^3 Hertz **Hertz = 1 x 10^{-3} kilohertz**

Megahertz = 1 x 10^6 Hertz **Hertz = 1 x 10^{-6} Megahertz**

Gigahertz = 1 x 10^9 Hertz **Hertz = 1 x 10^{-9} Gigahertz**

2- Wave motion

*** The wave:** It's a disturbance that propagates and transfers energy in the direction of propagation.

*** Wave motion:** It's the periodic motion produced by vibration of medium particles

*** Line of wave propagation:** It's the direction through which the wave propagates.

* Types of waves:

Mechanical waves	Electromagnetic waves
- They need a medium to propagate.	- They don't need a medium to propagate.
- They don't propagate through vacuum - space	- They propagate through vacuum - space
- They are transverse or longitudinal waves.	- They are transverse waves.
- Their speed is low.	- Their speed is great.
water waves (transverse) – sound waves (longitudinal).	- Ex: light waves – radio waves (used in radar).

*** Transverse waves:** disturbance medium particles vibrate perpendicular to direction of propagation.
- Transverse waves are formed of: the crest and the trough.

*** The crest:** It's the highest point of particles in transverse wave.
*** The trough:** It's the lowest point of particles in the transverse wave.

*** Longitudinal waves:** disturbance medium particles vibrate along the direction of propagation.
- Longitudinal waves are formed of: the compression and the rarefaction.

*** The compression:** area of particles are of highest density and pressure.
*** The rarefaction:** area of particles are of lowest density and pressure.

Crest = Compression Trough = Rarefaction

- **Jacuzzi:** It's a tube where water moves in the form of circular waves.
- **Uses of the Jacuzzi:** treating cramps by hot water and treating nervous tension by cold water.

  Wavelength of transverse wave: It's the distance between two successive crests or troughs.

  Wavelength of longitudinal wave: It's the distance between centers of two successive compressions or rarefactions.
- **Wave amplitude:** It's the maximum displacement of medium particles

- **Wave velocity (V):** It's the distance covered by the wave in one second (m/s). V = d (m) / t (sec)
  - **The unit of wave velocity is m / sec**
- Velocity of sound through solids is greater than through liquid and gas (air) .

- **Wave frequency (F):** It's the number of waves in one second (Hz).

- **Law of wave propagation:** Wave velocity (V) = Frequency (F) x Wave length (λ)

  m/s Hz m

1- Properties of sound waves

Sound: Is an external factor affects ear causing the sense of hearing.

*** Sound waves propagate through media as spheres whose center is the sound source.**

Sound velocity: Is the distance covered by sound waves in one second.

Sound velocity = frequency x wavelength

1-Musical tones: They are tones of uniform frequency and are comfortable to be heard (Ex. violin, piano, and reed pipe).

2-Noise It is a sound of non-uniform frequency and is uncomfortable to be heard (Ex. drill, loudspeakers, and car horns).

Sound pitch	Sound intensity	Sound quality
Property ear can differ between rough & sharp sounds	Property ear can differ between strong & weak sounds	Property ear can differ between sounds if equal in intensity & pitch
Depend on frequency	Depend on distance – density	Harmonic tones

Savart's wheel uses: It used to determine the pitch (frequency) of unknown tone.

Sound frequency = no. of cycles x no. of gear's teeth / Time (sec)

*** The intensity of sound measured by quantity of sound energy falling perpendicularly in one sec.**

*** The measuring unit of sound intensity is watt/m^2.**

*** The noise intensity is measured in a unit known as "Decibel".**

Factors affecting the sound intensity:

1- The distance 2- The amplitude 3- The density 4- Wind direction. 5- The area

Inverse square law of sound:

The sound intensity is inversely with square distance between the ear and sound source.

Harmonic tones:

They are tones with basic tone lower in intensity and higher in pitch

G.R Ear distinguishes between sounds from different sources even equal in intensity and pitch. Due to difference in harmonic tones

Types of sound waves:

Infrasonic waves	Sonic waves	Ultrasonic waves
Sound waves frequency lower than 20 Hz	Sound waves frequency from 20Hz to 20000Hz	Sound waves frequency higher than 20000 Hz
Not heard – blow storms	Heard	Not heard

The uses of ultrasonic waves:

1-Medical field: 1- Broken kidney stones. 2- Discover tumors.

2-Industrial field: Sterilize food .G.R Bec. they kill bacteria and stop action of viruses.

3-Military field: Discover landmines.

2- Wave nature of light

Light: It is an external factor affects the eye causing the sense of vision.
Light speed: It is the distance covered by light in one second.
Speed = Distance (m) / time (sec)
Visible light: one of components of electromagnetic spectrum of wavelengths between 380 to 700 nm.

1- Analysis of white Light: is splitting white light into 7 colors called the spectrum colors.
* White light consists of a mixture of 7 colors which are known as the "spectrum colors".
* These colors are Red - Orange - Yellow - Green - Blue - Indigo - Violet.
* When white light falls on a triangular glass prism it splits into seven spectrum colors.

Red (lowest frequency and energy – longest wavelength) -prism apex
Violet (highest frequency and energy – shortest wavelength) - prism base

* The German scientist Max Plank proved that light energy composed of quanta known as "photons".
* The energy of a photon is directly proportional to the frequency

Energy of light waves:
Photon energy = Plank's constant x photon frequency

Real-life applications for uses of light:
Light is used in home decorations like:

- Spotlights Stand lamps.

Media can be classified according to their ability to allow light to pass through:

1- Transparent medium:
It is a medium which permit most light pass through and objects can be seen clearly behind it.
Ex. Clear glass – air - glass cups - pure water.

By increase thickness of transparent medium, quantity of light pass through decreases
G.R water is transparent medium can't see fish at bottom of River Nile.
By increase thickness of medium, quantity of light pass through decreases

2- Translucent (semi- transparent) medium:
It is a medium which permit part of the light pass through it and absorbs the remaining part, and objects can be seen less clearly behind it.
Ex. (flint glass - tissue paper).

3- Opaque medium:
It is a medium that doesn't permit light pass through it, and objects can't be seen behind it.
Ex. Plant leaves – books – carton – metals – human skin – milk – wood – black honey – foil paper.

3- Light travels in straight lines:

Light intensity: It is the quantity of light falling perpendicular on a unit area of a surface in one second.

Inverse square law of light: The light intensity is inversely proportional to the square distance

3- Reflection and refraction of light

Light reflection: returning back of light waves in the same medium on meeting a reflecting surface.

Types of light reflection:

Regular reflection (uniform)	Irregular reflection (Non-uniform)
Reflection of light on smooth surface and rays reflect in one direction	Reflection of light on rough surface and rays reflect in different directions
Plane mirror – Piece of aluminum sheet – Stainless steel sheet	Leaf of tree – paper – leather - wool

Incident light ray: narrow beam of light, that falls on reflecting surface on point of incidence.

Reflected light ray: narrow beam of light, that reflects on reflecting surface on point of incidence.

Angle of incidence: angle between normal and incident ray.

Angle of reflection: angle between normal and reflected ray.

Laws of light reflection:

First law of reflection: Angle of incidence = angle of reflection.

Second law of reflection:

Incident ray, reflected ray, and normal all lie in one plane perpendicular to reflecting surface.

G.R. The ray that falls perpendicular on a reflecting surface, it reflects on itself.
Because angle of incidence = angle of reflection = zero.

Light refraction: change in light path when it travels between two media different in optical density.

Optical density of medium: Ability of the transparent medium to refract the light.

- Optical density differs from medium to another according to speed of light.

Angle of incidence: Angle between the incident light ray and the normal.

Angle of refraction: Angle between the refracted light ray and the normal.

Angle of emergence: Angle between the emergent light ray and the normal.

Laws of light refraction:

1- When light ray travels from lower density (air) to higher density (glass) What happen: light refracts near the normal. (Angle of incidence more than Angle of refraction)

2- When light ray travels from high density (glass) to low density (air) What happen: light refracts far from the normal. (Angle of incidence less than Angle of refraction)

3- When light ray falls perpendicular What happen: light passes without any refraction. (Angle of incidence = Angle of refraction = Zero)

Absolute refractive index:

Ratio between the velocity of light in air to velocity of light in another medium.

G.R Refractive index always greater than one.
Bec. velocity of light in air more than any medium.

G.RA pencil which is partially immersed in water appears as being broken.
Due to light refraction.

- A fish in water is seen in apparent position higher than its real position.

G.R Bottoms of swimming pools filled with water seem higher than their true position.
Due to light refraction, eyes see apparent position

Mirage:

It is a natural phenomenon occurs on desert roads at noon in summer object has inverted images
Due to refraction and reflection of light.

1- Reproduction in plants

Flower: It is a short stem whose leaves are modified into reproductive organs.

Inflorescence: It is a group of flowers arranged on the same axle.

Bract: It is the green leaf in which floral bud emerges

Receptacle: swollen part which floral leaves exist

Typical flower: the flower has 4 floral whorls

Whorl	Calyx	Corolla	Androecium	Gynoecium
Position	First – outer	Second	Third	Fourth – inner
Consists of	Sepals	Petals	Stamens (Filament – anther)	Carpels Ovary-style-stigma
Description	Green leaves	Colored leaves	Male organ	Female organ
Function	Protect inner parts of flower	- Attract insects - Protect reproductive organs	Produce pollen grains	Produce ovules

1- Male flowers: androecium Ex. Palms and maize.

2- Female flowers: gynoecium Ex. Palms and maize.

3- Hermaphrodite flowers: androecium and gynoecium Ex. Tulip, petunia, and wallflower.

sexual reproduction in plants:

Pollination: It is process of transfer pollen grains from flower anther to stigma.

Self-pollination (Auto)	Mixed-pollination (Cross)
Transfer of pollen grains from anther to stigma in same flower in same plant	Transfer of pollen grains from anther to stigma in the different flower in same kind

The methods of cross pollination:

Pollination by air

Stigma is feathery-like and sticky GR To catch pollen grains
Anther is hanging GR To be easily opened by air
Pollen grains is light – dry GR To be easily carried by air
Pollen grains produced by huge numbers GR To compensate what are lost in air

Pollination by insects

Flowers are colored and scented petals GR To attract insects
Pollen grains are sticky or having coarse surface GR To stick to the insect's body

Artificial pollination

Pollination taking place by the help of man

Fertilization: It is the process of the fusion of male cell (pollen grain) with female cell (ovum).

Stages of fertilization process in plants:

1- The pollen grain forming a pollen tube (2 male nuclei)
2- The pollen tube reaches the ovum through the micropyle.
3- Male nuclei fuse with the ovum forming the zygote.
4- The zygote divided many times to form the embryo inside the ovule.
5- The ovule develops and becomes a seed, but the ovary develops and becomes a fruit.

Zygote: the cell resulting from the fusion of male and female cell.

Fruits differ from each other according to the nature of the ovary:

*** An ovary that contains many ovules, gives many seeds as beans, peas and tomatoes .**
Fruits of single seed as peach and olives

Asexual reproduction:

Vegetative reproduction: reproduction in plants without flower by means of parts of roots, stems, leaves, or buds.

Natural vegetative reproduction	Artificial vegetative reproduction
It takes place by many ways as : Rhizomes – corms – tubers – bulbs – offshoots.	It takes place by many ways as : Cutting – grafting – tissue culture.

The tuber: swollen part of root or stem have buds Ex. root of sweet potatoes, or a stem of potatoes.

B- Artificial vegetative reproduction:

1- Cut: It is a part of the root, stem, or leaf that is taken from a plant for reproduction.

2- Reproduction by grafting:

Grafting by attachment	Grafting by wedge
In which the scion is attached to the stock Ex. Mango trees	In which the scion is inserted into a cleft in the stock Ex. Large trees

The scion feed on the juice of the stock

The reproduction by grafting used only between highly similar plant species.

3- Tissue culture: It is a process of multiplying a small part of a plant to get many identical parts.

Final Revision

Mr. Ahmed Elbasha

(1) Write the scientific term :

1	The distance covered by the wave in one second.	(.....)
2	A short stem whose leaves are modified to achieve reproduction in plant.	(.....)
3	Non-audible waves whose frequencies are less than 20 Hz.	(.....)
4	Maximum displacement of the oscillating body away from its rest position.	(.....)
5	The transfer of pollen grains from the anthers of a flower to the stigmas of another flower of the same kind.	(.....)
6	The measuring unit of noise intensity.	(.....)
7	It is a disturbance in which the particles of the medium vibrate along the direction of wave propagation.	(.....)
8	The flower that has four whorls.	(.....)
9	The fusion of one of the male nuclei with the ovum.	(.....)
10	The ability of the medium to refract light.	(.....)
11	The flower which contains both androecium and gynoecium.	(.....)
12	The motion produced as a result of the vibration of the particles of the medium at a certain moment in a definite direction.	(.....)
13	The motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction.	(.....)
14	It is an external stimulus that affects the ear and causes hearing.	(.....)
15	The process of transfer pollen grains from the flower anther to the stigma.	(.....)
16	A tool is used to determine the pitch of an unknown tone.	(.....)

17	A group of green leaves each of them is called sepal.	(.....)
18	The cell resulting from the fusion of the pollen grain and the ovum nuclei.	(.....)
19	The reflection in which light rays recoil in many different directions when falling on the rough surface.	(.....)
20	The amount of light that falling perpendicular to a unit area of a surface in one second.	(.....)
21	The property of sound by which the human ear can be distinguish between sharp and harsh sounds	(.....)
22	The number of complete oscillations produced by the oscillating body in one second.	(.....)
23	The time taken by the oscillating body to make one complete oscillation.	(.....)
24	The highest point in the transverse wave.	(.....)
25	The measuring unit of sound intensity	(.....)
26	The number of complete oscillations made by the body in one second.	(.....)
27	It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times.	(.....)
28	The change of light path when it travels from a transparent medium to another.	(.....)
29	A disturbance that propagates and transfers energy along the direction of propagation	(.....)
30	The angle between the emergent light ray and the normal.	(.....)
31	Angle of incidence= Angle of reflection	(.....)
32	The periodic motion of an oscillating body around its rest point, where the motion is repeated through equal intervals of time.	(.....)
33	Waves that need medium to travel and can't travel in space	(.....)
34	A property by which the human ear can distinguish between strong and weak sounds.	(.....)
35	Rebounding of light waves in the same medium due to meeting a reflecting surface.	(.....)

36	An angle between the incident light ray and the normal at the point of incidence on the interface.	(.....)
37	The flower that contains the four whorls	(.....)
38	The point of the lowest density and pressure in the longitudinal wave	(.....)
39	Bodies don't allow the passage of light through them.	(.....)
40	A new method to produce large numbers of plants from small parts of it.	(.....)
41	A floral whorl in the flower, whose function to attract insects as it is colorful and scented.	(.....)
42	The time needed by the oscillatory body to make a complete oscillation.	(.....)
43	It is a short stem whose leaves are modified to form the sexual reproduction.	(.....)
44	Waves of frequencies ranging from 20 Hz to 20000 Hz.	(.....)
45	The intensity of sound at a certain point is inversely proportional to the square of the distance between this point and the sound.	(.....)
46	The scientist who discovered that the energy of photon depends on its frequency.	(.....)
47	The ability of the medium to refract light rays.	(.....)
48	Fusion of the nucleus of the male cell with the nucleus of the female cell.	(.....)
49	The disturbance that propagates and transfers energy in the direction of propagation	(.....)
50	The area in the longitudinal wave, at which the medium particles are of the highest density and pressure	(.....)
51	The distance that a wave travels in one second.	(.....)
52	The product of Planck's constant times the frequency of photon.	(.....)
53	A modern way of multiplying a small part of the plant to get a large numbers of plants.	(.....)
54	It is a property by which the ears can distinguish between sound levels, either sharp or harsh.	(.....)

55	The ratio between the speed of light in air and its speed in a transparent medium.	(.....)
56	Wave consists of crests and troughs.	(.....)
57	The number of complete oscillations produced by the oscillating body in one second.	(.....)
58	Short stem where the leaves developed and modified into reproductive organs.	(.....)
59	The waves which need a medium to propagate.	(.....)
60	The reflection in which the light rays recoil in many directions, when falling on a rough surface.	(.....)
61	A phenomenon that appears in the desert as a result of reflection and refraction of light.	(.....)
62	The property by which the ears can distinguish between sounds with respect to the nature of the source even if they are equal in pitch and intensity.	(.....)
63	The motion produced as a result of the vibration of the particles of the medium at a certain moment and in a certain direction	(.....)
64	A new method to produce large numbers of plants from a small part of it.	(.....)
65	The angel between the reflected ray and the normal at the incidence point on the reflecting surface.	(.....)
66	The ability of the medium to refract light rays.	(.....)
67	The number of complete oscillations in one second.	(.....)
68	Sound waves their frequency is more than 20000 Hz.	(.....)
69	Incident ray, reflected ray and normal line, all locate in one plane which is perpendicular on reflecting surface.	(.....)
70	An instrument used to determine the frequency of unknown sound tone.	(.....)
71	A design composed of a tube, where water moves in the form of circular waves for treating sprains and cramps.	(.....)
72	Sound waves have frequency less than 20 Hz.	(.....)
73	A male hormone that responsible for the appearance of secondary sex characters	(.....)

✹(2) Choose the right answer:

1. The zygote contains ..... of the genetic material of the sperm.
a. half b. double c. quarter d. three times

2. The light ray refracts ..... the normal when it travels from air to glass.
a. near to b. away from c. perpendicular to d. along

3. All the following are from the factors affecting sound intensity except the .....
a. amplitude. b. frequency. c. density of medium. d. wind direction.

4. The ovule after fertilization becomes a .....
a. seed. b. seed coat. c. fruit. d. coat of fruit.

5. The amplitude of the simple pendulum is ..... of a complete vibration.
a. four times. b. a quarter. c. a half. d. double.

6. The quantum of energy of green light is ..... the quantum of energy of yellow light.
a. greater than b. equal to c. less than d. no correct answer

7. Light waves are ..... waves.
a. mechanical transverse b. electromagnetic longitudinal
c. electromagnetic transverse d. mechanical longitudinal

8. A sound wave travels in air with velocity 330 m/s and has a wavelength of 0.1 m, its frequency is .....
a. 330 KHz. b. 3300 Hz. c. 33 KHz. d. 330 Hz.

9. Sound of frequency 200 Hz is ..... than the sound of frequency 100 Hz.
a. sharper b. stronger c. harsher d. weaker

10. From the typical flowers is .....
a. palm. b. maize. c. petunia. d. pumpkins.

11. The absolute refractive index of water is .....
a. 0.5 b. 0.8 c. 0.33 d. 1.33

12. The ovum contains .....of the genetic material of the plant species.
a. double b. half c. quarter d. all

13. The artificial vegetative reproduction is done in plants by .....
a. grafting. b. cutting. c. tissue culture. d. all the previous.

14. When the incident light ray reflects on itself, the angle of incidence equals .....
a. 0° b. 90° c. 120° d. 180°

15. When the distance between the source of light and the surface of a wall is doubled, the light intensity on the surface .....
a. decreases to quarter. b. increases to double.
c. remains constant. d. no correct answer.

16. The human ear can distinguish sounds of frequency .....

a. 50 KHz. b. 30 KHz. c. 300 KHz. d. 50 Hz.

17. The speed of the ball of the simple pendulum ..... as we move away from the rest position.

a. doesn't affect b. decreases c. is doubled d. no correct answer

18. The ..... color light in the spectrum colours has the highest deviation.

a. white b. red c. violet d. yellow

19. The corolla leaves are called .....

a. petals. b. carpels. c. stamens. d. sepals.

20. Regular reflection appeared on .....

a. the skin. b. a plan mirror. c. a tree leaf. d. a piece of wood.

21. Flowers pollinated by air characterized by all of the following except .....

a. hanged anthers. b. feathery like stigmas.

c. scented petals. d. light pollen grains.

22. If the distance between the center of the third compression and that of the fifth compression is 20 cm, the wavelength of this wave is .....

a. 40 cm. b. 20 cm. c. 10 cm. d. 5 cm.

23. Pollen grains are formed inside the ..... of the flower.

a. carpel b. anther c. ovary d. calyx

24. The photon energy= Plank's constant x .....

a. wavelength. b. velocity. c. amplitude. d. frequency.

25. The distance between two successive compressions is called .....

a. frequency. b. periodic time. c. wavelength. d. velocity.

26. If the frequency of an oscillating body is 10 Hz, so the periodic time is ..... .

a. 10 sec. b. 0.01 sec. c. 0.1 sec. d. 1 sec.

27. The sound of frequency 500 Hz is ..... than the sound of frequency 100 Hz.

a. stronger b. sharper c. weaker d. harsher

28. When the distance between the light source and a certain surface is doubled, the light intensity on the surface .....

a. decreases to quarter. b. increases four times.

c. is doubled. d. remains constant.

29. The angle of incidence of light is ..... its angle of reflection.

a. larger than b. smaller than c. equal to d. no correct answer

30. After fertilization, the ovary develops to become a .....

a. fruit. b. sepal. c. petal. d. flower.

31. Tulip is an example for ..... flower.

a. female b. male c. bisexual

32. After fertilization, the ..... develops to become a seed.

a. flower b. ovary c. ovule

33. Sound of frequency 200 Hz is ..... than sound of frequency 100 Hz.

a. sharper b. stronger c. harsher d. weaker

34. If the angle between the incident light ray and the reflected light ray is 90°, so the angle of incidence equals .....

a. 0° b. 90° c. 45° d. no correct answer

35. The light waves are ..... waves.

a. mechanical transverse b. electromagnetic transverse
c. mechanical longitudinal d. electromagnetic longitudinal

36. The floral whorl, which is absent in the female flower is .....

a. calyx. b. corolla. c. androecium. d. gynoecium.

37. The sound velocity is maximum in .....

a. vacuum. b. gases. c. liquids. d. solids.

38. The periodic time of a tuning fork which makes 240 waves in one minute equals .....

a. 1 sec. b. 4 sec. c. 0.5 sec. d. 0.25 sec.

39. ..... waves are longitudinal waves.

a. Water b. Light c. Sound d. Radio

40. If the angle between the incident light ray and the reflected light ray is 30° so, the angle of reflection is .....

a. 30 b. 15 c. 60 d. 40

41. Pollen grains are produced from the .....

a. ovary. b. calyx. c. anther. d. gynoecium.

42. All of the following are factors affecting sound intensity except .....

a. amplitude of vibration. b. frequency.
c. medium density. d. wind direction.

43. A medium that prevents light to pass through it is called ..... medium.

a. transparent b. translucent c. opaque d. no correct answer

44. The submerged object in water as a fish is seen in an apparent position slightly above its real position due to ..... of the light rays.

a. refraction b. reflection c. analysis d. total internal reflection

45. From the methods of cross pollination is .....

a. air. b. insects. c. human. d. all of them.

46. White light analyzes into ..... spectrum colours.

a. 3 b. 5 c. 7 d. 9

47. The measuring unit of wave velocity is .....

a. meter. b. meter/sec. c. Hz. d. sec.

48. If the angle between the incident light ray and the reflected light ray is 40°, so the angle of reflection equals .....

a. 90° b. 80° c. 20°

49. The doctors use waves with a frequency ..... to break down kidney stones.

a. less than 20 Hz b. 20 Hz c. more than 20 KHz

50. Sound intensity in air is ..... that in carbon dioxide.

a. less than b. more than c. equal to

51. The absolute refractive index of any material is always ..... one.

a. less than b. more than c. equal

52. In ..... reflection, the reflected rays are reflected in many directions.

a. uniform b. irregular c. both (a) and (b)

53. All of these sounds are of uniform frequency except the sound of .....

a. piano. b. violin. c. loudspeakers. d. guitar.

54. The highest point in the transverse wave is called .....

a. trough. b. compression. c. crest. d. rarefaction.

55. All the following are electromagnetic waves except ..... waves.

a. light b. sound c. infrared d. radio

56. The voice of Adam differs from that of Sara because they are different in .....

a. age. b. intensity. c. pitch. d. kind.

57. The quantum of energy of green light is ..... the quantum of energy of yellow light.

a. greater than b. equal to c. smaller than d. no correct answer

58. ..... media do not allow light to pass through it.

a. Transparent b. Translucent c. Opaque d. no correct answer

59. The floral whorl which is absent in the female flower is .....

a. calyx. b. corolla. c. androecium. d. gynoecium.

60. If the angle between the incident light ray and the reflected light ray is 90°, so the angle of reflection will be equal .....

a. 0° b. 30° c.45° d. 90°

61. Plank's constant= the photon energy divided by photon .....

a. frequency. b. density. c. wavelength. d. amplitude.

62. Doctors use waves of a frequency ..... to break down kidney and ureter stones.

a. more than 20 Hz b. less than 20 KHz
c. 20 Hz d. more than 20 KHz

63. The produced fruit by grafting belongs to the type of the .....

a. scion. b. cut. c. stock. d. bud.

64. The maximum displacement made by the oscillating body away from its original position is .....

a. amplitude. b. frequency. c. periodic time. d. complete.

65. The distance between two successive troughs or two successive crests in the transverse wave is .....

a. wavelength. b. amplitude. c. frequency. d. wave velocity.

66. Pollination in coloured flowers takes place by ..... .

a. insects. b. man. c. water. d. air.

67. The sound velocity is measured in ..... unit.

a. Hertz b. m/sec. c. decibel d. metre

68. The human skin is considered as a/an ..... medium.

a. transparent b. opaque c. translucent d. no correct answer

69. If the light speed in air is higher than that in another transparent medium, so the refractive index is .....

a. zero b. 1 c. more than 1 d. less than 1

70. Two gears of Savart's wheel rotate at a same velocity, if the number of teeth of the first gear is 90 teeth and the number of the second is 60 teeth, then the ratio between their frequencies is .....

a. 1 : 2 b. 3 : 2 c. 2: 1 d. 5: 2

71. Artificial vegetative reproduction by cutting can be done in .....

a. peach. b. palm. c. grapes. d. olive.

72. If a light ray falls from water to air with an angle of incidence 35°, then the angle of refraction will be .....

a. 47.5° b. 35° c. 28.5° d. 29.5°

73. The measuring unit of noise intensity is .....

a. decibel. b. Hz. c. watt/m2 d. metre.

74. All of the following plants reproduce sexually except.....

a. bean plant. b. pea plant. c. potato. d. olive plant.

75. When distance between sound source and the ear is doubled, the sound intensity .....

a. decrease to its half b. increases twice.
c. decreases to its quarter. d. increases four times

76. The male reproductive organ in the flower is .....

a. gynoecium. b. corolla. c. calyx. d. androecium.

77. The light ray refract ..... the normal when it travels from air to glass.

a. near to b. away from c. perpendicular to d. along

78. A pencil seems broken when it is placed in a glass cup of water due to ..... of light.

a. critical angle b. mirage c. refraction d. reflection

79. An organ which is responsible for formation of ova in the flower is .....

a . another. b. ovary. c. corolla. d. stamen.

80. Sound wave travels in air with velocity of 340 m/s. and its frequency is 20 Hz. The wavelength of it is .....

a . 14 cm. b. 170 cm. c. 170 m. d. 1700 cm.

81. The plant ovary produces .....

a. Pollen grains. b. ovum. c. sperms. d. ovule.

82. ..... is a short stem where leaves developed and modified into reproductive organs.

a. Tuber b. Flower c. Stock d. Scion

83. The colorful and scented flower leaves are called .....

a. sepals. b. stamens. c. carpels. d. petals.

84. The angle of incidence of light ray is 30°, so the angle of reflection is .....

a. 30° b. 60° c.90°

85. The human ear cannot hear sound of frequency .....

a. 50 Hz. b. 300 Hz. c. 10 Hz.

86. The male reproductive organ in flower is .....

a. gynoecium. b. androecium. c. corolla.

87. The ovum contains ..... of the genetic material of the plant species.

a. half b. all c. quarter

88. The artificial vegetative reproduction is done by .....

a. cutting. b. grafting. c. all the previous.

89. Velocity of sound in air equals ..... m/s.

a. 340 b. 1500 c. 3×10^8

90. From artificial vegetative reproduction .....

a. cutting. b. grafting. c. tissue culture. d. (a) , (b) and (c).

91. Calyx consists of a group of green leaves each of them is called .....

a. sepal. b. carpel. c. petal. d. micropyle.

92. The result of multiplying frequency of an oscillating body by its periodic time equals .....

a. one. b. negative value. c. constant value. d. variable value.

93. A natural phenomenon takes place on the desert roads at noon due to reflection and refraction of the light .....

a. lightning. b. thunder. c. mirage. d. rainbow.

94. After fertilization, the ovule develops into .....

a. ovary. b. fruit. c. seed. d. seed coat.

95. The measuring unit of noise intensity is .....

a. Hertz. b. Watt/m^2 . c. Cycles/sec. d. Decibel.

96. We can hear all of the following sounds except .....

a. 40 Hz. b. 60 KHz. c. 10 KHz. d. 60 Hz.

97. Light refraction is due to the difference in ..... through different media.

a. sound intensity b. nature of the surface

c. light velocity d. all the previous answer.

98. The absolute refractive index of any material is always .....

a. more than one. b. less than one. c. equal to one. d. equal zero.

99. The zygote contains ..... of the genetic material of the plant species.

a. half b. all c. quarter d. third

100. The artificial vegetative reproduction is done in plants by .....

a. cutting. b. grafting. c. tissue culture. d. all the previous.

101. The flower is a modified .....

a. stem. b. leaf. c. root. d. branch.

102. The transverse waves consists of .....

a. crests and compressions. c. crests and troughs.

b. compressions and rarefactions. d. rarefactions and troughs.

103. Sound of different musical instruments can be differentiated from each other by .....

a. harmonic tones. b. fundamental tone.

c. sound intensity. d. sound pitch.

104. The submerged object in water is seen in an apparent position slightly above its real position due to ..... of light.

a. reflection b. interference c. diffraction d. refraction

105. The male genital system consists of vas deferens, penis and ……..…….

a- urethra b- cervix c- vagina d- endometrium

✹(3) Complete the following :

1. Light is ..... waves but sound is ..... waves.
2. ..... is a transparent medium of light but wood is a(an) ..... medium.
3. The ovule inside the ovary is converted into ..... after fertilization.
4. ..... waves are used in breaking the stones of kidneys and ureters.
5. Sharp tones have ..... frequencies, while rough tones have ..... frequencies.
6. ..... is the male reproductive organ in the plant, while ..... is the female reproductive organ in the plant.
7. Harmonic tones are lower in ..... and higher in ..... than fundamental tones.
8. In transverse wave, the particles of the medium vibrate ..... the direction of wave propagation.
9. In the flower, the corolla consists of colored leaves, each leaf is called .....
10. The ratio between the velocity of light through air to the velocity of light through another transparent medium is known as .....
11. The outer whorl of the flower is the ..... and it consists of leaves called .....
12. Angle of ..... is the angle between the refracted light ray and .....
13. The measuring unit of noise intensity is ....., while the measuring unit of the periodic time is .....
14. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
15. The velocity of the oscillating body reaches its ..... value when it passes its rest position.
16. Transverse wave consists of ..... and .....
17. The human ears can't detect the sound waves of frequencies less than ..... and that of frequencies more than .....
18. When light travels from a medium of ..... optical density to another of ..... optical density, it refracts far from the normal line.
19. Types of pollination are ..... and .....
20. The reflection of light is classified into two types which are ..... and .....
21. Fertilization is process of fusion the male cell nucleus with ..... nucleus to form .....
22. If the angle between the incident light ray and the reflecting surface is 25°, so the angle of reflection = ...

23. The frequency of sonic waves ranges between ..... Hz to ..... KHz.

24. The voice of women is ..... pitched, while the voice of men is ..... pitched.

25. The cell produced from the fusion of pollen grain with the ovum nucleus is called .....

26. Sound ..... is the property by which the ear can distinguish between harsh and sharp sounds.

27. Waves are classified according to the ability to propagate and transfer energy into ..... and ..... waves.

28. Complete oscillation consists of ..... displacements (amplitudes).

29. Max Planck proved that the energy of light wave consists of energy quanta known as .....

30. The calyx of the flower consists of green leaves called .....

31. Stamen consists of anther and .....

32. Savart's wheel is used to determine the ..... of an unknown tone.

33. The stigmas are feathery like and sticky to .....

34. ..... is the reflection of light rays when they meet a rough surface.

35. A pencil partially immersed in water appears as being .....

36. The periodic time of an oscillating body which make 480 oscillations in one minute equals .....

37. The measuring unit of noise intensity is ..... , while ..... is the measuring unit of the amplitude.

38. After fertilization, the ovary grows forming the ..... , while the ovule converted into .....

39. The glass prism is used to analyses the ..... light into ..... colors.

40. As the amplitude increases, the sound intensity .....

41. Infrasonic waves are sound waves of frequencies less than ..... Hz.

42. When a light ray falls perpendicular on a reflecting surface the angle of reflection equals .....

43. Sound pitch is a property by which ear can distinguish between ..... and .....

44. Sound wave velocity = ... x .....

45. ..... motion is the motion which is regularly ..... in equal periods of time.

46. Sound travels through air as pulses of ..... and . .....

47. In the uniform reflection, the light rays reflect in ..... direction when they fall on a ..... surface.

48. The energy of the photon is ..... proportional to the ..... of the light wave.

49. ..... color has the longest wavelength, while ..... has the shortest wavelength.

50. If the vertical distance between crest and trough is 4 cm, the amplitude equals ..... cm.

51. ..... are transverse waves, while ..... waves may be longitudinal or transverse waves.

52. Oscillatory motion and ..... motion is from ..... motion.

53. Light intensity is ..... proportional to ..... of the distance between the surface and the source.

54. The flower of pumpkins is ..... flower, while the flower of tulip is ..... flower.

55. When you look at a coin in a glass of water, its ..... position appears to be lower than the ..... position.

56. The maximum displacement done by the oscillating body away from its rest point is called .....

57. Stamen of the flower consists of ..... and .....

58. The measuring unit of the frequency is ..... but the measuring unit of the noise intensity is .....

59. Pollen grains which spread by wind are produced by ..... numbers, and their weight is .....

60. Sounds can be classified into two groups, musical tones of ..... frequency and noises of ..... frequency.

61. The human skin is considered ..... medium, while pure glass is ..... medium for light.

62. The Sound if from ..... waves that can't travel through.....

63. In a flower, the calyx consists of ....., but group of petals form .....

64. The high-pitched sound waves have high ..... and small .....

65. Waves are classified according to their ability to propagate and transfer energy into..... and .....

66. There are two types of periodic motion which are ..... motion and ..... motion.

67. Light ..... is the change of light path when it travels from a transparent medium to another one of different .....

68. The light velocity is the distance .....

69. Light travels through the ..... media in ..... lines.

70. Sound waves are longitudinal waves because particles of the medium vibrate ..... the direction of wave propagation.

71. The light reflection is classified in two types which are ..... and .....

72. From properties of light is that light travels in ..... lines.

73. The frequency of the oscillation body is measured by unit called .....

74. The measuring unit of sound intensity is ..... while that of noise intensity is .....

75. The angle of incidence ..... the angle of reflection.

76. In the ..... waves, the particles of the medium vibrate perpendicular to the direction of wave propagation.

77. The ..... are small cells that formed in the anther of the flower.

78. The sound intensity at a point is ..... proportional to the square of the distance between this and the source of sound.

79. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.

80. Each carpel consists of a swollen part called ovary which connects with tube called ..... and ending in.....

81. The frequency of sonic waves ranges between..... Hz and ..... Hz

82. The amplitude equals ..... of a complete oscillation.

83. Sound is produced from ..... of bodies.

84. The natural vegetative reproduction in potatoes is done by.....

85. Frequency of sonic wave, ranges between ..... Hz and ..... Hz.

86. ..... is considered the simplest form of oscillatory motion.

87. Calyx of a flower consists of green leaves called ..... but corolla consists of colored leaves called .....

88. From the artificial vegetative reproduction in plant are ..... and .....

89. If the angle between the incident light ray and reflected light ray is 100° , so the angle of reflection = ...

90. The sound velocity is measured in ..... unit while the sound intensity is measured in .....

91. The bisexual flower contains ..... and ....., but the male flower contains ..... only.

92. In ..... reflection, rays are reflected in one direction.

93. The complete oscillation include 4 displacements, each one is called.....

94. ..... sound wave accompany the blowing of storms before rainfall.

95. After fertilization the ovary of the flower grows forming the.....

✹(4) Correct the underlined words:

1	The motion of the rotatory bee is considered as **an oscillatory motion**	(.....)
2	The **infrasonic** waves are used in breaking down kidney stones.	(.....)
3	Sound pitch is increased by **decreasing** the frequency.	(.....)
4	Light propagates in **zigzag** lines.	(.....)
5	A complete oscillation comprises of **two** amplitudes.	(.....)
6	The angle between the incident light ray and the reflected light ray = 100°, so the angle of reflection = **60°**	(.....)
7	Reproduction by tubers can be used in **apples**	(.....)
8	The human skin is considered as **translucent** medium.	(.....)
9	The energy of light quantum is directly proportional to its **wavelength**	(.....)
10	The big coloured flowers are pollinated by **air**	(.....)
11	The crest in the transverse wave is equivalent to the **bottom** in the longitudinal wave	(.....)
12	We see the submerged objects in water in a **lower** position than its real position	(.....)
13	Fusion between the pollen grain and the ovum is called **pollination**.	(.....)
14	Changing the light ray path when it faces a transparent object is considered **light reflection**	(.....)
15	The light travels in **curved** lines.	(.....)
16	The absolute refractive index of any material is always **smaller than one**	(.....)
17	In pollination by **water** the flower has feathery like and sticky stigma	(.....)
18	The movement of the clock pendulum is an example of **wave motion.**	(.....)
19	The sound intensity **decreases**, when the source of sound touches an empty box	(.....)

20	**Yellow** colour is the first colour in spectrum colours.	(.....)
21	Each carpel consists of ovary, **filament** and stigma	(.....)
22	**Sonic** waves are used in sterilization of milk.	(.....)
23	From the types of natural vegetative reproduction is **tissue culture.**	(.....)
24	Frequency of infrasonic waves is less than **2000** Hz.	(.....)
25	If the distance between the first crest and the second crest on the wave propagation is 10 cm, then the wavelength of this wave is **20** cm.	(.....)
26	Human ear can distinguish between sound of frequencies ranging between **10** : 20000 Hz.	(.....)
27	**Ovule** consists of stigma, style and ovary.	(.....)
28	Particles of the medium vibrate along the direction of the wave propagation in the **transverse** wave	(.....)
29	The angle of incident of a light ray is **greater than** the angle of reflection.	(.....)
30	**Oscillatory** motion is the motion that is repeated regularly in equal periods of time.	(.....)
31	The produced tone from a tuning fork is called **complicated tone**	(.....)
32	**Rainbow** phenomenon takes place on desert roads at noon specially in summer.	(.....)
33	Colored **sepals** attract insects for pollination.	(.....)
34	The **infrasonic** waves are used in breaking down kidney stones.	(.....)
35	Speed of sound in water is slower than in **air**.	(.....)
36	Changing light ray path on facing transparent object is considered **light reflection**	(.....)
37	Reproduction by tubers can be used in **apples and pears.**	(.....)
38	As the density of medium decreases, **amplitude increases.**	(.....)
39	Unit of sound intensity is **Hertz**.	(.....)

40	Harmonic tones companying the fundamental tone lower in **pitch**.	(.....)
41	The wall of the **ovule** after fertilization forms the wall of the fruit.	(.....)
42	Reproduction by **tuber** happens in orange and oaring.	(.....)
43	When the sound source touches a resonance box, the sound intensity **decreases**.	(.....)
44	Grafting by **wedge** in which scion is attached to stock.	(.....)
45	**Oscillatory** motion is the motion that is repeated regularly in equal time.	(.....)
46	Light **refraction** is rebounding of light wave in the same medium.	(.....)
47	Sweet potatoes is reproduced by **grafting**.	(.....)
48	The sound intensity **decreases** by increasing the density of the medium and vice versa.	(.....)
49	The result of multiplying the frequency of an oscillating body by its periodic time equals **variable value.**	(.....)
50	Angle of **refraction** = angle of reflection.	(.....)
51	Sugar cane is reproduced by **grafting**.	(.....)
52	The wall of the ovary after fertilization form **fruit**.	(.....)
53	Particles of the medium vibrate along the direction of the wave propagation in the **transvers waves**.	(.....)
54	The produced tone from tuning fork is called **complicated tone.**	(.....)
55	The flower which pollination is occurred by **insects** has hanged anther and sticky stigmas.	(.....)
56	**Light** waves used in radars.	(.....)
57	Syphilis is caused by a special type of **spherical** bacteria	(.....)

✹(5) Give reason for:

1. The periodic time decreases as the number of complete oscillations increases.

.....

2. The pen seems broken when it is put in a glass of water.

.....

3. The use of ultrasonic waves in milk sterilization

.....

4. Wood doesn't allow the passage of light through it.

.....

5. Man sometimes has to pollinate palm trees.

.....

6. When a light ray is incident perpendicular to the reflecting surface, it reflects on itself.

.....

7. The waves produced due to vibration of strings are transverse mechanical waves.

.....

8. Auto pollination can't happen in sunflower.

.....

9. The energy of red light photon is less than the energy of violet light photon.

.....

10. Sound waves are mechanical waves while radio waves are electromagnetic waves.

.....

11. Sound travelling in air has less intensity than that travelling in carbon dioxide.

.....

12. Man cannot hear all sounds produced by dolphins.

.....

13. Occurrence of mirage phenomenon in desert region at noon.

.....

14. Light can travel through free space.

.....

15. Clear glass is a transparent medium.

.....

16. Absolute refractive index of any transparent medium is always greater than one.

.....

17. A light ray transfers from a transparent medium to another and doesn't refract.

.....

18. We see lightning before hearing thunder.

.....

19. The petals of corolla are colourful.

.....

20. The piano sound differs from that of the violin even if they have the same sound properties.

.....

21. On doubling the distance between the light source and the surface, the light intensity decreases.

.....

22. Olive fruit contains only one seed, while pea fruit contains more than one seed.

.....

23. To pick up a coin which has fallen in water, we must look at it vertically.

.....

24. The floor of the swimming pool appears higher than its real position.

.....

25. The fish in water is seen in an apparent position slightly above its real position.

.....

26. Light can travel through space.

.....

27. Oscillatory motion is considered as a periodic motion.

.....

28. The flower of bean plant is bisexual.

.....

29. **Palm plant is unisexual.**

.....

30. **Auto pollination can't happen in sunflowers**

.....

31. **Sound can be heard from all surrounding directions.**

.....

32. **The petals of corolla are colored and scented.**

.....

33. **Water waves are mechanical transverse waves.**

.....

34. **The stigma of air pollinated flowers are feathery like and sticky.**

.....

35. **The periodic time decrease as the number of complete oscillation increases.**

.....

36. **A light waves are considered electromagnetic waves.**

.....

37. **The testes stop their production of testosterone hormone**

.....

✹(6) What happen if:

1. The frequency of an oscillating body increases (concerning its periodic time) .

.....

2. The oscillating body passes its rest position during its movement (concerning its velocity).

.....

3. Decreasing the amplitude of the sound source to its half (concerning the sound intensity).

.....

4. A pollen grain falls on a stigma.

.....

5. The frequency of a wave is doubled (concerning the wavelength) when the wave velocity is constant.

.....

6. Incidence of a white light ray on one face of a triangular glass prism.

.....

7. Ovary after fertilization.

.....

8. A light ray travels from a transparent medium of high optical density to another of lower optical density.

.....

9. A light ray falls perpendicular to the interface between two different transparent media.

.....

10. Light falls on flint glass.

.....

11. When the distance between the light source and a surface is doubled (concerning the light intensity).

.....

12. When you put a ringing mobile phone on a resonance box (concerning the sound intensity).

.....

13. Incidence of light rays on a rough surface.

.....

14. Pollen grains transfer from the anther to the stigma of the same flower.

.....

15. Vibration of particles of a medium perpendicularly to the direction of wave propagation.

.....

16. A pollen grain falls on the stigma of a flower.

.....

17. Pollen grain falls on the stigma of a flower.

.....

18. The stigma of a flower doesn't secrete sugary solution after pollination process.

.....

19. Incidence of light rays on a rough surface.

.....

20. The sound wave travels from solid to water (concerning it's velocity)

.....

21. The wave length increases to the double value when the wave velocity is constant (concerning the frequency).

.....

22. A light ray falls perpendicular on a reflecting surface.

.....

23. Light rays falls perpendicular to the interface between different transparent media of different optical densities.

.....

24. The distance between the sound source and the ear becomes double (concerning the sound intensity).

.....

✹(7) Put (√) or (X) :

1. The fish is seen higher than its real position in the fish tank. ( )
2. The complete oscillation includes four successive amplitudes. ( )
3. The velocity of the oscillating body is maximum when it passes through the original position. ( )
4. Androecium is the female reproductive organ in plant. ( )
5. Stigma is the male reproductive organ in the flower. ( )
6. The movement of pendulum is an example for wave motion. ( )
7. Bats, dogs and dolphins can hear ultrasonic waves. ( )
8. The sound intensity decreases, when the source of sound touches an empty box. ( )
9. The light ray refracts towards the normal when it travels from air to glass. ( )
10. The velocity of the oscillating body is minimum when it passes its rest position ( )
11. The corolla is the male reproductive organ in the flower. ( )
12. Infrasonic waves are used in breaking down stones of kidney. ( )
13. Sound can be heard from all directions that surround the sound source. ( )
14. Harmonic tones that accompany the fundamental tone are lower in pitch. ( )
15. Reproduction by tubers can be used in apples and pears. ( )
16. Wood doesn't allow the passage of light through it. ( )
17. The measuring unit of sound intensity is decibel. ( )
18. Sound velocity through liquids is more than that through gases. ( )
19. The pollen grains of the air pollinated flowers are sticky and have coarse surface. ( )
20. If the angle between the incident light ray and the reflecting surface is 40°, so the angle of reflection equals 40° according to the first law of light reflection. ( )
21. The pendulum motion is an example of wave motion. ( )
22. The typical flower contains three whorls. ( )
23. Drill is an example of the musical tones. ( )
24. The energy of light = Constant x Wavelength. ( )
25. Androecium in the flower is responsible for producing pollen grains. ( )
26. The particles of the medium vibrate along the direction of the wave propagation in longitudinal wave ( )

27. The sound intensity deceases when it touches a resonance box ( )

28. The swing is an example of periodic motion ( )

29. The typical flower contains three whorls. ( )

30. Light waves are electromagnetic transverse wave. ( )

31. Sound intensity increase as amplitude increase. ( )

32. Sound can be heard from all directions that surround the sound source ( )

33. Sound intensity increases when wind and sound waves are in the same direction ( )

34. The absolute refractive index for any transparent medium is less than 1 ( )

35. From ways of artificial vegetative reproduction are cutting, grafting and tubers ( )

36. The sound velocity through solids is less than that through liquids. ( )

37. Sonic waves are used in sterilizing food substances. ( )

38. The wall of ovary after pollination forms the coat of the fruit. ( )

39. The sound intensity increases as the amplitude increases. ( )

40. Reproduction by tuber happens in orange and bitter orange. ( )

41. The transverse wave consists of compressions and troughs. ( )

✹(8) What is meant by Define .... ?

1. Complete oscillation.

2. Ultrasonic waves.

3. The inverse square law of light.

4. Sound pitch.

5. Flower.

6. Sonic waves.

7. Light intensity.

8. Periodic time.

9. Fertilization in plant.

10. Light refraction.

11. Absolute refractive index of water is 1.33

12. The wavelength of a sound wave is 1.5 m.

13. Regular reflection of light.

14. Angle of incidence of a light ray = 30°

15.Mixed pollination.

16.Mirage phenomenon.

17.Harmonic tones.

18.Speed of light.

19.Amplitude.

20.Sound intensity

21.First law of reflection. 2. Visible light.

22.The angle of reflection of a light ray equals 45°

23.The wave.

24.Light reflection.

25.Periodic motion.

26.Pollination.

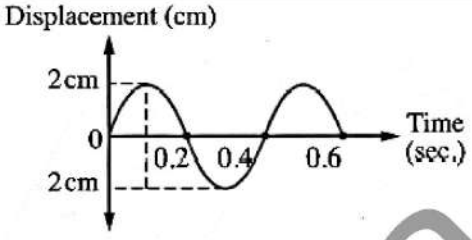
27.The amplitude of an oscillating body is 3 cm.

✹(9) Problems

1

From the opposite figure, calculate :

1. Amplitude.
2. Periodic time.
3. Frequency.



.....

.....

.....

2

Calculate the frequency of a musical tone similar to the tone produced from Savart's wheel rotating with a velocity of 960 cycles in two minutes, knowing that the number of gear teeth= 30 teeth.

.....

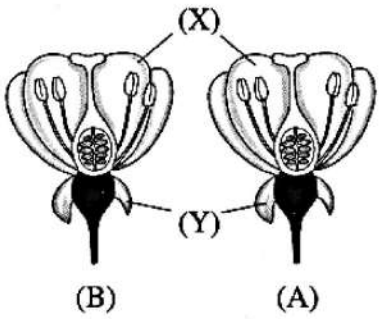
.....

.....

.....

3

Look at the opposite figure, then answer the following :



1. What is the function of the parts (X) and (Y) ?
2. Pollen grains from flower (A) are transferred to the ova in flower (B) :
   a. What is the type of pollination that happened ?
   b. Write two methods for this kind of pollination.
   c. What is the sex of the flower (B) ?
   d. Write the name of two plants having the same sex of flower shown in the figure.

.....

.....

.....

.....

.....

.....

.....

4

Calculate the speed of light through diamond given that the absolute refractive index of it = 2.4 and the speed of light through air = 3 x 10⁸ *m/s*.

.....

.....

.....

5

Label the figure :

① .....

② .....

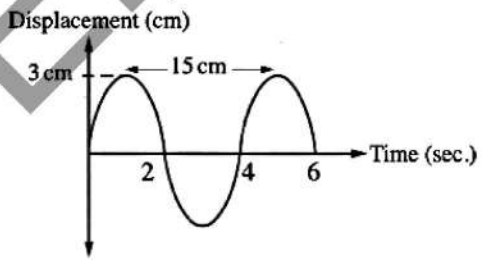
③ .....

④ .....

6

From the opposite figure, calculate :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Periodic time.



.....

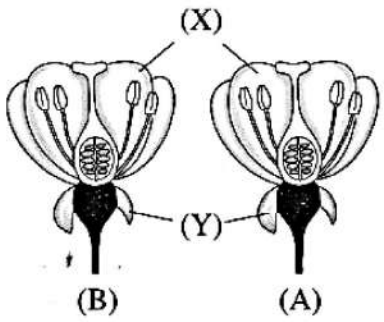
.....

.....

7

The opposite figure shows two flowers of two plants of the same species :

1. What's the function of the parts (X) and (Y) ?
2. Pollen grains from the flower (A) are transferred to the ova in flower (B) :
   a. What's the type of pollination that happened ?
   b. What's the sex of flower (A) ?



.....

.....

.....

8

savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of the gear, calculate the number of teeth of the gear.

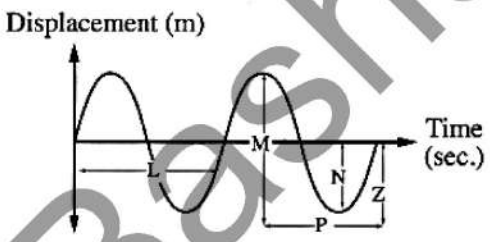
.....

.....

.....

9

The opposite figure represents an oscillatory motion for a simple pendulum. Choose the letter that denotes :



1. The oscillation of the pendulum forming $\frac{3}{4}$ complete oscillation.
2. The amplitude.

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10

Calculate the number of gear teeth of Savart's wheel, if a musical tone similar to the frequency of an emitted tone = 160 Hz, and Savart's wheel rotated with a velocity of 960 cycles in three minutes.

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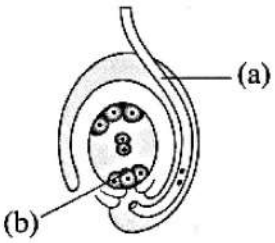
11

From the opposite figure :



1. Part (a) represents .....
2. When one of the two male nuclei fuses with (b) is formed .....
3. After fertilization, the ovum of this plant converts into ..... , then the ovary converts into .....
4. Identify fertilization process.

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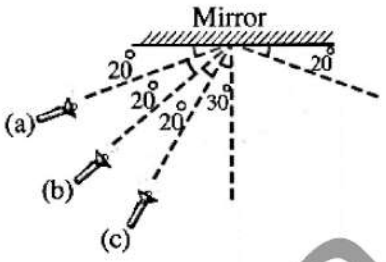
12

The opposite figure represents a torch emits light falls on a mirror :

1. Torch ..... represents the following reflection.
2. The angle between the reflected light ray and its incident light ray = ...
3. Identify the second law of reflection of light.



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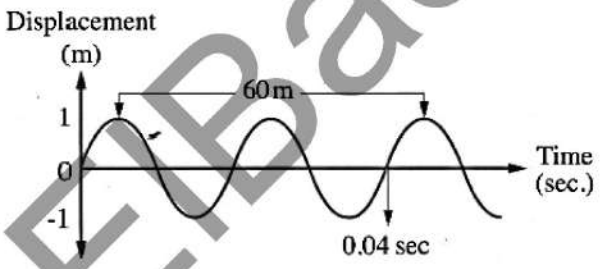
13

From the opposite figure, calculate :

1. Frequency.
2. Wavelength.
3. Velocity of the wave.



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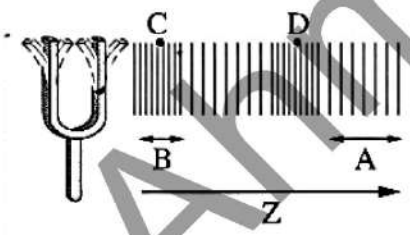
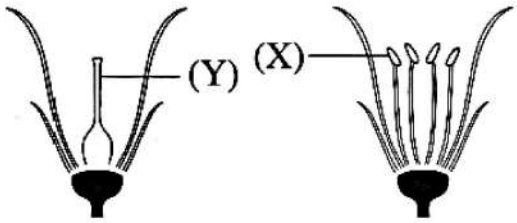
14

(1)



1. What is the kind of the produced wave ?
2. Label points (A) and (B).
3. What's the name of the distance between (C) and (D) ?
4. The arrow (Z) refers to the .....

(2)



1. What is the name of parts (X) and (Y) ?
2. Mention the function of part (X).
3. What is the sex of flowers (A) and (B) ?

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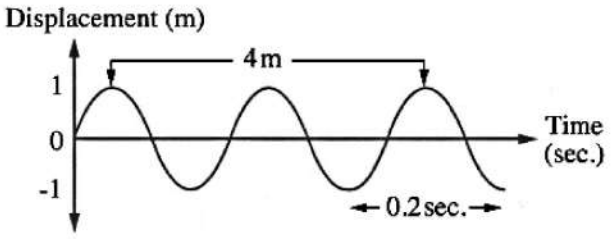
15

From the opposite figure, find :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.



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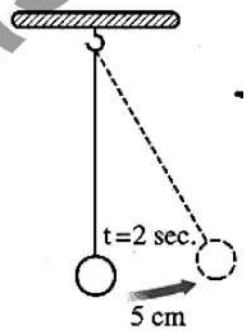
16

From the opposite figure, calculate the following :

1. Amplitude.
2. Periodic time.
3. Frequency.



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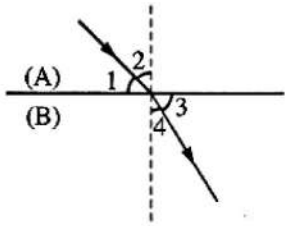
17

From the opposite figure, find the number that refers to the following :

1. The angle of incidence.
2. The angle of refraction.
3. Which medium (A) or (B) is greater in the optical density ?



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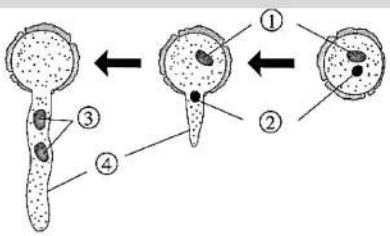
18

From the opposite figure :

1. The figure represents .....

2. Write the labels of the figure.

3. Select the number of the parts that share in producing the zygote.



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19

Sound waves of frequency 200 Hz and wavelength 1.7 meter, Calculate :

1. The velocity of sound waves propagation in air.

2. The wavelength of these waves of frequency 200 Hz when they propagate in water with velocity 1500 m/s.

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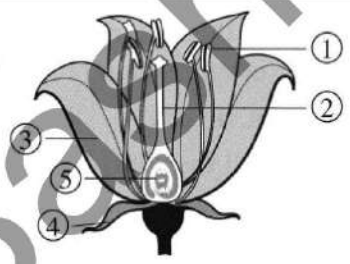
20

Complete the labels on the figure, and mention :



1. The sex of the flower.

2. Its symbol.

3. The way of reproduction.

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21

calculate the frequency of a musical tone similar to the frequency of a produced tone using Savart's wheel rotated with a velocity of 960 cycles in two minutes, given that the number of teeth of the gear is 30 teeth.

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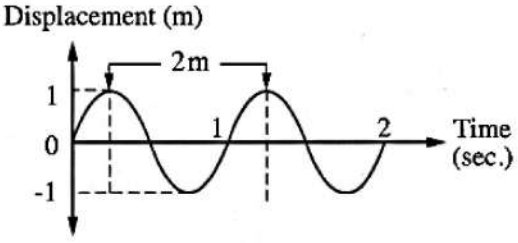
22

From the opposite figure, find :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.



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23

Complete the opposite figures after redrawing them in your answer sheet then complete the following statements :

1. In fig. (1) the angle of reflection = ...
2. In fig. (2) the angle of incidence = ...

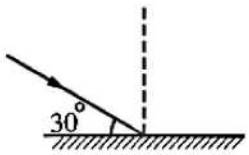


Fig. (1)

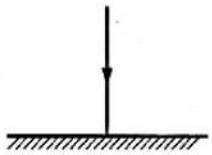
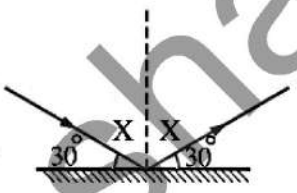


Fig. (2)

24

From the opposite figure :

1. Calculate the angles of incidence and reflection.
2. What can you conclude from this figure ?
3. What will happen if this light ray falls perpendicular on the reflecting surface ?



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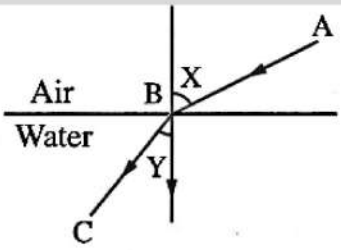
25

From the opposite figure, answer :

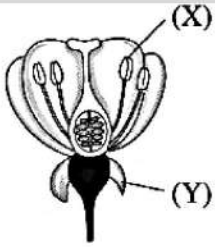
1. The ray (AB) represents .....
2. The ray (BC) represents .....
3. Angle (X) is .....
4. Angle (Y) is .....



26

In the opposite figure :

1. Mention the name of parts (X) and (Y).
2. What is the function of part (Y) ?
3. Identify the sex of this flower.



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Model Answer

(1) Write the scientific term :

1. Wave velocity
2. The flower
3. Infrasonic waves
4. Amplitude
5. Cross-pollination
6. Decibel
7. Longitudinal wave
8. Typical flower
9. Fertilization
10. Optical density of medium
11. Bisexual
12. Wave motion
13. Complete oscillation
14. Sound
15. Pollination
16. Savart wheel
17. Calyx
18. Zygote
19. Irregular reflection
20. Light intensity
21. Sound pitch
22. Frequency
23. Periodic time
24. Crest
25. Watt/m^2
26. Frequency
27. Mirage
28. Light refraction
29. Longitudinal waves
30. Angle of emergence
31. First law
32. Oscillatory motion
33. Mechanical waves
34. Sound intensity
35. Light reflection
36. Angle of incidence
37. Typical flower
38. Rarefaction
39. Opaque object
40. Tissue culture
41. Corolla
42. Periodic time
43. Flower
44. Sonic waves
45. Inverse square law of sound
46. Max blank
47. Optical density of medium
48. Fertilization
49. Wave
50. Compression
51. Wave velocity
52. Photon energy
53. Tissue culture
54. Sound pitch
55. Absolute refractive index
56. Transvers waves
57. Frequency
58. Flower
59. Mechanical waves
60. Irregular reflection
61. Mirage
62. Sound quality
63. Periodic motion
64. Oscillatory motion
65. Angle of reflection
66. Optical density of medium
67. Frequency
68. Ultrasonic waves
69. Second law
70. Savart wheel
71. Jacuzzi
72. Infrasonic
73. Testosterone

(2) Choose the right answer:

1. B	15. A	29. C	43. C	57. A	71. C	85. C	99. B
2. A	16. D	30. A	44. A	58. C	72. A	86. B	100. D
3. B	17. B	31. C	45. D	59. C	73. A	87. A	101. A
4. A	18. C	32. C	46. C	60. C	74. C	88. C	102. C
5. B	19. A	33. A	47. B	61. A	75. C	89. A	103. A
6. A	20. B	34. C	48. C	62. B	76. D	90. D	104. D
7. C	21. C	35. C	49. C	63. A	77. A	91. A	105. A
8. B	22. C	36. C	50. A	64. A	78. C	92. A	
9. A	23. B	37. D	51. B	65. A	79. B	93. C	
10. C	24. D	38. D	52. B	66. A	80. D	94. C	
11. D	25. C	39. C	53. C	67. B	81. D	95. D	
12. B	26. C	40. B	54. C	68. B	82. B	96. B	
13. D	27. B	41. C	55. B	69. C	83. D	97. C	
14. A	28. A	42. B	56. C	70. B	84. A	98. A	

✹(3) Complete the following :

1. Electromagnetic – mechanical
2. Glass opaque
3. Seed
4. Ultrasonic
5. High – low
6. Androecium – gynoecium
7. Intensity – pitch
8. Perpendicular
9. Petal
10. Absolute refractive index
11. Calyx - sepal
12. Refraction – normal
13. Decibel
14. Transverse – compression
15. Maximum
16. Crest - trough
17. 20 - 20000
18. Higher – lower
19. Self - cross
20. Regular – irregular
21. Female – zygote
22. 65
23. 20 – 20
24. High – low
25. Zygote
26. Pitch
27. Electromagnetic – mechanical
28. Four
29. Photons
30. Sepal
31. Filament
32. Frequency
33. Catch pollen grains
34. Irregular
35. Brocken
36. 0.125
37. Decibel – meter
38. Fruit – seed
39. White – seven
40. Increase
41. 20
42. Zero
43. Sharp – harsh
44. Frequency x wavelength
45. Periodic – repeated
46. Compression – rarefaction
47. One – smooth
48. Directly – frequency
49. Red – violet
50. 8
51. Electromagnetic – mechanical
52. Wave – periodic
53. Directly – square
54. Unisexual – bisexual
55. Real – apparent
56. Amplitude
57. Anther – filament
58. Hertz – decibel
59. Huge – light
60. Uniform – non uniform
61. Opaque – transparent
62. Mechanical – vacuum
63. Sepal – corolla
64. Frequency – amplitude
65. Transverse – longitudinal
66. Oscillatory – wave
67. Refraction – density
68. Covered by light in one second
69. Transparent – straight
70. Along
71. Regular – irregular
72. Straight
73. Hertz
74. Watt/m^2
75. Equals
76. Transverse
77. Pollen grains
78. Inversely
79. Transverse – compression
80. Style – stigma
81. 20 – 20000
82. Quarter
83. Vibration
84. Tubers
85. 20 – 20000
86. Simple harmonic motion
87. Sepal – petal
88. Cutting – grafting
89. 50
90. m/sec - Watt/m^2
91. Androecium – gynoecium
92. Regular
93. Amplitude
94. Infrasonic
95. Fruit

✹(4) Correct the underlined words:

1. Periodic
2. Ultrasonic
3. Increase
4. Straight
5. Four
6. 50
7. Potatoes
8. Opaque
9. Frequency
10. Insects
11. Compression
12. Higher
13. Fertilization
14. Light refraction
15. Straight
16. More
17. Air
18. Oscillatory
19. Increase
20. Red
21. Style
22. Ultrasonic
23. Tuber
24. 20
25. 10
26. 20
27. Carpel
28. Longitudinal
29. Equal
30. Periodic
31. Fundamental
32. Mirage
33. Petals
34. Ultrasonic
35. Solid
36. Light reflection
37. Potatoes and sweet potatoes
38. Intensity decrease
39. Watt/m^2
40. Intensity
41. Ovary
42. Grafting
43. Increase
44. Attachment
45. Periodic
46. Reflection
47. Tuber
48. Increase
49. One
50. Incident
51. Cutting
52. Pericarp
53. Longitudinal waves
54. Fundamental tones
55. Wind
56. Radio
57. Spiral

✹(5) Give reason for:

1. Because the number of complete oscillations is inversely proportional to the periodic time.
2. Due to the refraction of light rays coming from the immersed part in water , where the eye sees the immersed part of the pencil on the extensions of these refracted rays.
3. Because they have high ability to kill some types of bacteria and stop the action of some viruses.
4. Because it is an opaque medium.
5. To ensure the pollination process, as pollination is difficult to occur by insects or by air.
6. Because angle of incidence= angle of reflection= zero.
7. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through.
8. Because their anthers and stigmas are not maturated at the same time.
9. Because the frequency of red light photon is less than that of orange light photon.
10. Because sound waves need a medium to propagate through, while radio waves don't need a medium to propagate through.
11. Because the density of carbon dioxide gas is more than that of air, since sound intensity is directly proportional to the density of the medium.
12. Because dolphins produce ultrasonic waves, while the human ears can't hear sounds of frequencies more than 20 kilohertz
13. Due to reflection and refraction of light in air layers which differ in the degree of temperate
14. Because it is electromagnetic waves which don't need a medium to travel through.
15. Because clear glass permits most light to pass through and objects can be seen clearly through it.
16. Because the velocity of light through air is always greater than that through any other transparent medium.
17. Because the angle of incidence = zero.
18. Because the velocity of light waves of lightning (electromagnetic waves) is much greater than that of sound waves of thunder (mechanical waves).
19. To attract insects to the flower which help in the sexual reproduction process.
20. Due to the difference in harmonic tones that associate the fundamental tone of each of them.
21. Because intensity of light is inversely proportional to the square of the distance between the surface and light source.
22. Because the ovary of olive contains only one ovule, while that of bean contains many ovules.
23. Because the ray which falls perpendicular to the interface passes to air without refraction, so the apparent position is the real position.
24. Due to light refraction.
25. Due to the refraction of light rays coming from the submerged object (far from the normal) where the eye sees the submerged object on the extensions of the refracted rays
26. Because it is electromagnetic waves which don't need a medium to travel through.
27. Because it is repeated regularly in equal periods of time.
28. Because its flower contains four whorls.
29. Because the flowers contain only male or female reproductive organ.
30. Because their anthers and stigmas are not maturated at the same time.
31. Because sound travels through air as spheres of compressions and rarefactions whose center is the sound source
32. To attract insects to the flower which help in the sexual reproduction process.
33. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through
34. To catch pollen grains from air.
35. Because the number of complete oscillations is inversely proportional to the periodic time.
36. Because Light waves don't need a medium to propagate through.
37. the male doesn't reach to the puberty.

✹(6) What happen if:

1. The periodic time will decrease
2. Its velocity increases to the maximum value.
3. Sound intensity will decrease
4. It will germinate fanning a pollen tube.
5. The wavelength decreases to its half value.
6. The white light analysis into seven colours.
7. The ovary will grow to become a fruit.
8. It will refract.
9. It will pass without refraction.
10. It permits only a part of light to pass through and absorbs the remaining part.
11. The light intensity decreases to its quarter.
12. The intensity of the produced tone increases.
13. The light rays are reflected in many directions.
14. It will germinate fanning a pollen tube.
15. Transverse waves are formed
16. It will germinate fanning a pollen tube.
17. It will germinate forming a pollen tube
18. The pollen grain will not stick on stigma, and then pollen grain will not germinate
19. Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids
20. Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids
21. The frequency will decrease to half since ($v = F \times \lambda$).
22. The light ray will reflect on itself
23. The light ray will pass without any refraction
24. The sound intensity will decrease to its quarter.

✹(7) Put (√) or (X) :

1. (√)	8. (X)	15. (X)	22. (X)	29. (X)	36. (X)
2. (√)	9. (√)	16. (√)	23. (X)	30. (√)	37. (X)
3. (√)	10. (X)	17. (X)	24. (X)	31. (√)	38. (√)
4. (X)	11. (X)	18. (√)	25. (√)	32. (√)	39. (√)
5. (X)	12. (X)	19. (X)	26. (√)	33. (√)	40. (X)
6. (X)	13. (√)	20. (X)	27. (X)	34. (X)	41. (X)
7. (√)	14. (X)	21. (X)	28. (√)	35. (√)	

✹(8) What is meant by Define .... ?

1. It is the motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction.
2. They are sound waves of frequencies higher than 20000 Hz (20 KHz).
3. The light intensity of a surface is inversely proportional to the square of the distance between the surface and the source of light.
4. It is the property by which the ear can distinguish (differentiate) between harsh and sharp voices.
5. It is a short stem whose leaves are modified into reproductive organs.
6. They are sound waves of frequencies ranging from 20 Hz to 20 KHz
7. It is the quantity of light falling perpendicular to a unit area of a surface in one second.
8. It is the time taken by an oscillating body to make one complete oscillation.
9. It is the process of fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum) to form the zygote.
10. It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density.
11. The ratio between the velocity of light through air to that through water is 1.33
12. The distance between the centers of two successive compressions or two successive rarefactions is 1.5 m.
13. It is the reflection of light rays when they meet (fall on) a smooth (uniform) and glistening reflecting surface, where the incident light rays are reflected
14. The angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence is 30 °
15. It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in other plant of the same kind.
16. It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times, where objects on the road sides seem as if they have inverted images on a wet area.
17. They are tones that accompany the fundamental (basic) tone but they are higher in pitch and lower in intensity and differ from one instrument to another.
18. It is the distance which is covered by light in one second.
19. It is the maximum displacement done by the oscillating body away from its rest position.
20. It is the property by which the ear can distinguish (differentiate) between either strong and weak sounds.
21. Angle of incidence = Angle of reflection
22. The angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence = 45 °
23. It is the disturbance that propagates and transfers energy in the direction of propagation.
24. It is the rebounding of light waves in the same medium on meeting a reflecting surface.
25. It's a motion which is regularly repeated in equal periods of time.
26. It is the process of transfer of pollen grains from the flower anthers to the stigmas.
27. The maximum displacement done by the oscillating body away from its rest position is 3 cm (0.03 m).

✹(9) Problems

1

1. Amplitude = 2 cm = 0.02 m.
2. Periodic time = 0.4 sec.
3. Frequency = $\frac{1}{\text{Periodic time}} = \frac{1}{0.4} = 2.5$ Hz.

2

Sound frequency (F)

$= \frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$

$= \frac{960 \times 30}{120} = 240$ Hz.

3

1. Part (X) : - Protection of reproductive organs of the flower.
   - Attraction of insects to the flower, which help in the reproduction process.

   Part (Y) : Protection of the inner parts of the flower specially before blooming.
2. a. Mixed (cross) pollination.
   b. - Pollination by air (wind).
   - Pollination by insects.
   c. Bisexual (hermaphrodite) flower.
   d. - Tulip.
   - Petunia.

4

The absolute refractive index of diamond

$= \frac{\text{Velocity of light through air}}{\text{Velocity of light through diamond}}$

$2.4 = \frac{3 \times 10^8}{\text{Velocity of light through diamond}}$

Velocity of light through diamond

$= \frac{3 \times 10^8}{2.4} = 1.25 \times 10^8$ m/sec.

5

① Petal. ② Anther.
③ Ovary. ④ Sepal.

6

1. Wavelength = 15 cm = 0.15 m.
2. Frequency = $\frac{1}{4} = 0.25$ Hz.
3. Amplitude = 3 cm = 0.03 m.
4. Periodic time = $\frac{1}{0.25} = 4$ sec.

7

1. Part (X) : - Protection of reproductive organs of the flower.
   - Attraction of insects to the flower, which help in the reproduction process.

   Part (Y) : Protection of the inner parts of the flower specially before blooming.
2. a. Mixed (cross) pollination.
   b. Bisexual (hermaphrodite) flower.

8

Sound frequency (F) =

$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$

$600 = \frac{300 \times \text{Number of gear teeth}}{60}$

Number of gear teeth $= \frac{600 \times 60}{300} = 120$ teeth.

9

1. P 2. N

10

Sound frequency (F) =

$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$

$160 = \frac{960 \times \text{Number of gear teeth}}{180}$

Number of gear teeth $= \frac{160 \times 180}{960} = 30$ teeth.

11

1. pollen tube. 2. zygote.
3. a seed – a fruit.
4. It is the process of fusion of the nucleus of the male cell (pollen grain) with the nucleus of the female cell (ovum) to form the zygote.

12

1. (a) 2. 140°
3. The incident light ray, the reflected light ray and the normal to the surface of reflection at the point of incidence, all locate in one plane perpendicular to the reflecting surface.

13

1. Frequency $= \frac{2}{0.04} = 50$ Hz.
2. Wavelength $= \frac{60}{2} = 30$ m.
3. Wave velocity = Frequency × Wavelength
   $= 50 \times 30 = 1500$ m/sec.

14

(1) 1. Longitudinal wave.
2. (A) Rarefaction.
   (B) Compression.
3. The wavelength.
4. direction of wave propagation.

(2) 1. (X) Anther.
   (Y) Style.
2. It produces and holds pollen grains.
3. - Flower (A) is a female flower.
   - Flower (B) is a male flower.

15

1. Wavelength $= \frac{4}{2} = 2$ m.
2. Periodic time $= 2 \times 0.2 = 0.4$ sec.
   Frequency $= \frac{1}{\text{Periodic time}} = \frac{1}{0.4} = 2.5$ Hz.
3. Amplitude = 1 m.
4. Wave velocity = Wavelength × Frequency
   $= 2 \times 2.5 = 5$ m/sec.

16

1. Amplitude = 5 cm = 0.05 m.
2. Periodic time $= 4 \times 2 = 8$ sec.
3. Frequency $= \frac{1}{\text{Periodic time}} = \frac{1}{8}$
   $= 0.125$ Hz.

17

1. 2 2. 4 3. Medium (B).

18

1. germination of a pollen grain.
2. ① Generative nucleus.
   ② Tube nucleus.
   ③ Two male nuclei.
   ④ Pollen tube.
3. Parts no. ③

19

1. Velocity of sound = Frequency × Wavelength
   $= 200 \times 1.7 = 340$ m/sec.
2. Wavelength $= \frac{\text{Velocity}}{\text{Frequency}} = \frac{1500}{200} = 7.5$ m.

20

1. Fertilization. 2. The wave.
3. The compression.
4. The flower. 5. Infrasonic waves.
6. Optical density of the medium.
7. Vegetative reproduction.

21

Sound frequency (F)
$= \frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$
$= \frac{960 \times 30}{120} = 240$ Hz.

22

1. Wavelength = 2 m.
2. Frequency $= \frac{\text{Number of complete oscillations}}{\text{Time in seconds}}$
   $= \frac{2}{2} = 1$ Hz.
3. Amplitude = 1 m.
4. Wave velocity = Wavelength × Frequency
   $= 2 \times 1 = 2$ m/sec.

23

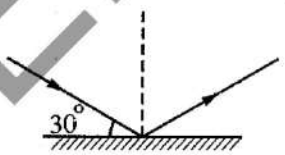


Fig. (1)

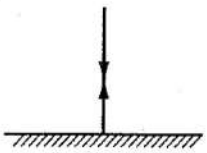


Fig. (2)

1. 60° 2. zero

24

1. Angle of incidence = 90° – 30° = 60°
   Angle of reflection = 90° – 30° = 60°
2. Angle of incidence = Angle of reflection
3. It will reflect on itself.

25

1. incident ray. 2. refracted ray.
3. angle of incidence.
4. angle of refraction.

26

1. Part (X) : Anther.
   Part (Y) : Sepal.
2. It protects the inner parts of the flower specially before blooming.
3. Bisexual (hermaphrodite) flower.

1) Complete the following statements:

1. **The outer whorl of the flower is called ……., each leaf is called ……**
2. **The male reproductive organ in flower is…, while the female reproductive organ in flower is ……**
3. **The …….hormone in male and …….hormone in female are responsible for the appearance of secondary sex characters.**
4. **Fertilization is the process of fusing the male cell nucleus (pollen grains) with Nucleus to form …….**
5. **The egg contains …….of genetic material of the plant species, while zygote contain …….of genetic material of the plant species.**
6. **…….glands an……gland are from glands associated with male genital system.**
7. **……. and …… are female sex hormone.**
8. **After fertilization, the ovary grows forming ……while the ovule converts into …**
9. **Each stamen consists of ……. and …….**
10. **The calyx is a group of …….leaves, each leaf is called …….**
11. **The sperm and ovum are fused together to form ……. which carries pairs of chromosomes.**
12. **Each ovary produces on ovum every days in exchange with the other ovary.**
13. **Calyx consists of green leaves called .. , but corolla consists of colored leaves called……..**
14. **From the artificial vegetative reproduction in plants are ……., ……. and …….**
15. **The testis function is to produce ……. and secrete the……hormone.**
16. **The bisexual flower contains ……. and …….**
17. **The human zygote results from the fusion of ……. and …….**
18. **The sperm consists of ……., middle part and …….**
19. **…….differ according to the nature of the ovary either contain one or more ova.**
20. **The vas deferens transports ……. from…… To urethra.**
21. **Sweet potatoes is considered as ……., while the potatoes are and reproduction of them is done by …….**

22. **Sharp tones have ……, while rough tones have……. frequencies.**

23. **The measuring unit of sound intensity is… , while the measuring unit of noise intensity is……**

24. **The distance covered by light in one second is called……**

25. **Frequency of sonic waves ranges between……Hz and Hz**

26. **The reflection is classified into two types which are …… and ……**

27. **Sound intensity is the property by which the ear can distinguish between …… and ……sounds**

28. **Sound pitch is the property by which the ear can distinguish between …… and ……sounds**

29. **From the factors affecting sound intensity are …… and ……**

30. **If the angle between the reflected ray and the perpendicular to the reflecting surface is 40°, the incidence angle is……**

31. **A sound wave travels in air with velocity 330 m/s and has a wavelength of 0.5 m, its frequency is……**

32. **Angle of …… is the angle between the refracted light ray and the….. at the point ofincidence on the separating surface.**

33. **The sound is considered from .. waves , because it needs a medium**

34. **When you look at a coin in a glass of water, its position appears to be lower than …… Position.**

35. **Sound intensity at certain point is …..proportional to the square of the distance between**

this point and the sound source, and is……proportional to the square of the amplitude.

36. **The ratio between light speed in air and light speed in a medium is calledof a medium.**

37. **From the natural phenomenon that are related to the reflection and refraction of light are…… and ……**

38. **A pencil partially immersed in water appears as being……**

39. **If the angle between the incident light ray and the reflecting surface is 25°, so the angle of reflection = ...**
40. **As amplitude increases, the sound intensity .....**
41. **Savart's wheel is used to determine.....**
42. **Hertz is the unit which measures the of the oscillating body.**
43. **..... is the measuring unit of frequency, while is the measuring unit of amplitude.**
44. **The result of multiplying the frequency by periodic time equals.....**
45. **Transverse wave consists of..... and .....**
46. **Longitudinal wave consists of.....and.....**
47. **The complete oscillation contain successive displacements.**
48. **If the periodic time of an oscillating body is 0.1 sec., so the number of complete oscillations in one minute is .....**
49. **Waves are classified according to the ability to propagate and transfer energy into.....and .....**
50. **..... travels in air with velocity 340 m/s**
51. **The periodic motion is the motion which is regularly repeated in equal.....**
52. **..... is considered the simplest form of oscillatory motion.**
53. **The sound is considered from... waves, because it needs a medium.**
54. **When an oscillating body makes 500 complete oscillations in a time = 2 minutes, its periodic time equals.....**

2) Write scientific term for the following:

1. **Short stem where the leaves are developed and modified into reproductive organs.....**

3) **The outer whorl of floral leaves which consists of a group of green sepals.....**

4) **A flower that contains androecium and gynoecium.....**

5) **Leaves of floral whorl that consists of fine filament ending by a sac.....**

6) **It is the pollination carried out by man.....**

7) **A hormone produced by the testis**

8) **A floral whorl in the flower, its function is to attract insects.**

9) **A sac-like structure that regulates and keeps the temperature of testis 2 degrees below the normal body temperature.**

10) **The cell resulting from the fusion of pollen grains and ovum nucleus.**

11) **The transfer of pollen grains from the anthers of a flower to the stigma of another flower on another plant.**

12) **The fusion of the male cell (pollen grain) with female cell (ovum).**

13) **The female reproductive organ in flower.**

14) **A flower that contains androecium only.**

15) **A group of glands their function is to secrete semen.**

16) **The reproduction of some plants by parts of the roots, stem or leaves.**

17) **A new method of producing large numbers of plants from a small part of it.**

18) **The process of multiplying a small part of plant to get many identical parts.**

19) **18. A tube with funnel shaped opening transports the ovum to the uterus.**

20) **19. The genetic material which carries genes those are responsible for the hereditary traits of the organisms.**

21) **20. A cell, which its nucleus contain 23 pairs of chromosomes resulting from the fusion of sperm and ovum.**

22) **The changing of light ray path when moving from a transparent medium to another transparent medium.**

23) **They are sound waves of frequency less than 20 Hz.**

24) **The distance covered by light in one second.**

25) **24. A property by which the ear can distinguish between sharp and rough sounds.**

26) **25. A property by which the ear can distinguish between strong and weak sounds.**

27) **26. The ability of the medium to refract light.**

28) **27. A phenomenon that appears in the desert as a result of reflection.**

29) **It is an external factor that affects the ear causing the sense of hearing.**

30) **They are tones that accompany the fundamental tone, but they are lower in frequency and higher in pitch.**

31) **30. A type of reflection takes place on a dirty plan mirror.**

32) **The angle of incidence = the angle of reflection.**

33) **An angle between the refracted light ray and the normal at the point of incidence at the interface.**

34) **The sound intensity is inversely proportional to square of the distance between the surface and sound source.**

35) **The angle between the refracted light ray and the normal at the incidence point.**

36) **The reciprocal of the frequency.**

37) **The maximum displacement done by the oscillating body away from its original position.**

38) **The number of complete oscillations produced by the oscillating body in one second.**

39) **The time taken by the oscillating body to make one complete oscillation.**

40) **The direction through which the wave propagates.**

41) **The motion which is regularly repeated in equal periods of time.**

42) **The motion of the oscillating body around its rest position.**

43) **The area in the longitudinal wave at which the medium particles are away from each other.**

44) **The highest point in the transverse wave.**

3) Choose the correct answer:

1. **Pollen grains are produced in.....**

   a. stigma b. filament c. anther d. ovary

2. **The floral leaves of typical flower are arranged in floral leaves.**

   a. two b. three c. five d. four

3. **The flower is a modified .....**

   a. stem b. leaf c. root

4. **The zygote contain..... of the genetic material of egg cell.**

   a. half b. all c. quarter

5. The bisexual flower contains .....

a. only androecium b. only gynoecium c. androecium and gynoecium

6. After fertilization, the ovary grows forming .....

a. seed b. fruit c. flower

7. The green leaves surrounding the flower are.....

a. carpels b. stamens c. petals d. sepals

8. Fertilization is the process of fusion of male and female cells to form .....

a. zygote b. sperm c. ovum d. pollen grain

9. The floral whorl which is not found in the female flower is .....

a. calyx b. androecium c. corolla d. gynoecium

10. A mobile cell of a relatively small size in human is called .....

a. sperm b. ovum c. ovule d. pollen grain

11. .....occur when zygote is formed

a. embryo b. fertilization c. pollen grain d. ovum

12. All the following are parts of male reproductive system except.....

a. vas deferens b. uterus c. testis d. Cowper's gland

13. **All the following methods are examples for artificial vegetative reproduction except.....**

a. cutting b. bulbs c. grafting d. tissue culture

14. All of the factors affecting sound intensity except.....

a. amplitude b. frequency c. medium density d. wind direction

15. The angle between the incident light ray and the reflected light ray is 40°, so the angle of reflection is .....

a. 20° b. 40° c. 80° d. 90°

16. **The number of teeth gear in savart's wheel increase, the of the produced sound increase**

a. amplitude b. intensity c. frequency d. quality

17. **From the natural phenomenon that resulted from reflection of light is .....**

- echo b. mirage c. seeing objects higher than normal position

18. . The human ear can hear sound of frequency.....

a. 300 Hz b. 30 KHz c. 50 KHz

19. If the angle between the incident light ray and the reflecting surface = 40°, so the angle of reflection of light = ...

a. 30° b. 40° c. 50° d. 60°

20. . The sound of frequency 200 Hz is than the sound of frequency 100 Hz

a. stronger b. sharper c. weaker d. harsher

21. The amplitude of the harmonic tone is that of fundamental tone.

a. smaller than b. larger than c. equal to d. (a) and (b) are correct

22.The doctors use waves which have frequency to break down kidney and uterus stones.

b. less than 20 Hz b. 20 Hz c. more than 20 KHz

23. When a light ray passes from glass to air, it refracts to the normal.

a. near to b. away from c. perpendicular to

24. If the distance between sound source and the ear increases 3 times, so intensity of sound.....

a. decreases to b. increases 3 times c. decreases to d. decreases

25. All the following are examples of the oscillatory motion except.....

c. swing b. spring c. rotary bee d. tuning fork

26 .....is (are) mechanical waves.

a. water waves only b. sound waves only c. both (a) and (b)

27. **All the following are electromagnetic waves except.....**

a. light b. sound c. x-ray d. radio

28. **The periodic time of an oscillating body which makes 240 oscillations in one minute = ...**

a. 1 sec. b. 0.25 sec. c. 0.5 sec. d. 4 sec.

4) Correct the underlined word:

1. **The stamen consists of stigma, style and ovary.**
2. **The corolla is the male reproductive organ in the flower**
3. **Ovaries produce sperm and male hormone.**
4. **The egg contains quarter of the genital material of plant species.**
5. **Palm trees are pollinated by air.**
6. **The two glands that lie outside the body in sacrotal sac are called two anthers.**
7. **From type of reproduction are sexual and bisexual.**
8. **The estrogen hormones are responsible for pregnancy take place and continue.**
9. **In pollination by water, the flower has feathery like and sticky.**
10. **The rose is a group of flowers arranged on the same axle.**
11. **Ovule consists of stigma, style and ovary.**
12. **The ovum is a mobile cell, of a relatively small size.**
13. **The ovaries are adapted to receive the ovum and deliver it to the uterus.**
14. **Sugar can is reproduced by grafting.**

15. **<u>Penis</u> transfers the sperms from the testis to the urethra.**
16. **The angle of incidence light ray <u>is greater than</u> angle of reflection.**
17. **The sound velocity through liquids <u>is less than</u> that through gases.**
18. **Human ear can distinguish sounds of frequency ranging between <u>10</u>: 20000 Hz.**
19. **Infrasonic waves can be used to determine industrial defects.**
20. **Angle of refraction = angle of reflection**
21. **Particles of the medium vibrate along the direction of the wave propagation in the transverse wave.**

5) What happens when?

1) **Pollen grain falls on the stigma of a flower.**

……

2) **If there is no seminal fluid in male.**

……

3) **The middle part (mid-piece) of a sperm is damaged.**

……

4) **Ovaries of the human female are not secreting the progesterone hormone**.

……

5) **The stigma of a flower doesn't secrete sugary solution after pollination process.**

……

6) **Incidence of light rays on a rough surface.**

……

7) **The sound wave travels from solid to water (concerning it's velocity)**

……

8) **The wave length increases to the double value when the wave velocity is constant (concerning the frequency).**

……

9) **A light ray falls perpendicular on a reflecting surface.**

……

10) **Light rays falls perpendicular to the interface between different transparent media of different optical densities.**

……

11) The distance between the sound source and the ear becomes double (concerning the sound intensity).

.....

12) The oscillating body passes its rest position during its movement (concerning its velocity).

.....

13) **The oscillating body reaches the position of its maximum displacement during its movement (concerning its kinetic energy).**

.....

14) A light ray travels from a more optically dense medium like glass to less optically dense as air.

.....

6) What is meant by?

1) Pollination in flowers.....
2) Self pollination.....
3) Cross pollination in plants.....
4) Artificial pollination.....
5) Fertilization in flower.....
6) Zygote.....
7) Hermaphrodite flower.....
8) Tissue culture.....
9) Sound pitch.....
10) Sound intensity.....
11) Sonic waves.....
12) The absolute refractive index of water is 1.33.....
13) Mirage.....
14) Angle of emergence.....
15) Light reflection.....
16) Light refraction.....
17) Optical density.....
18) The oscillatory motion.....
19) The wave.....
20) The oscillating body makes 200 oscillations in 2 minutes.....
21) The wavelength of a sound wave is 30 cm.....

,

7) Mention one use or function for the following:

1) **Calyx**.....
2) **Epididymis**.....
3) **Gynoecium**.....
4) **The corolla**.....
5) **Anthers of flowers**.....
6) **Ovary in female human**.....
7) **Fallopian tubes**.....
8) **Testis**.....
9) **The sacrotal sac**.....
10) **Head of sperm**.....
11) **Midi-piece of sperm**.....
12) **Testosterone hormone**.....
13) **Estrogen hormone**.....
14) **Progesterone hormone**.....
15) **Prostate, seminal vesicles and Cowper's glands**.....
16) **Ultrasonic waves**.....
17) **Jacuzzi (physiotherapy tubes)**.....
18) **Radio waves**.....

8) Give reason for the following:

1) **The petal of corolla is colorful and scented?**

2) **The fallopian tubes are lined with cilia?**

3) **The presence of the testis in human male outside the body in the sacrotal sac?**

4) **Palm flowers are unisexual?**

5) **Flowers pollinated by insects produce coarse pollen grains?**

6) **Hearing thunder after seeing lightning although they both happen at the same time?**

7) **Auto pollination happens in barley plant, while can't happen in sunflowers?**

8) **The sperm has a long and a thin tail?**

9) **The uterus is lined with mucus membrane rich in blood capillaries?**

10) **The uterus is a suitable organ for the growth of embryo?**

11) **Peach fruit contains only one seed?**

12) **The seminal fluid is alkaline?**

13) **When a light ray is incident perpendicular to a reflecting surface, it reflects on itself?**

14) **The floor of a swimming pool appears higher than its real position?**

15) **15. A pencil in a glass of water appears broken?**

16) **Sound of man harsh, while sound of woman sharp?**

17) **Sound travelling in air has less intensity than travelling in carbon dioxide?**

18) **Light can travel through free space?**

19) **The absolute refractive index for any transparent media is larger than 1?**

20) **The use of ultrasonic waves in milk sterilization?**

21) **The motion of rotary bee is considered as a periodic motion, but is not considered as an oscillatory motion?**

22) **The motion of a spring is an oscillatory motion?**

23) **We can't hear the sound of solar explosions, while we can see the light coming out of it?**

9) Compare between:

1) **Calyx and corolla (concerning of leaves and function).**

2) **Sperm and ovum (concerning of size, the mobility (movement), the structure and number).**

3) **Unisexual flowers and bisexual flowers**.

4) **The sound of lion and sound of sparrow (according to sound pitch and frequency).**

5) **Infrasonic and ultrasonic waves (frequency – examples).**

6) **Mechanical and electromagnetic waves (definition, properties and examples).**

7) **Oscillatory motion and wave motion (concerning definition and examples of each of them).**

8) **Transverse wave and longitudinal wave (definition, components of each, wavelength and examples).**

10) What happens for each of the following after fertilization?

1) **Ovary**

2) **Ovule**

3) **Zygote**

11) Different types of questions:

1) **If a spiral spring makes a longitudinal wave, calculate**

   i. **The wavelength of this wave, if you know that the distance between the second and thefourth compressions is 20 cm.**

   ii. **The wave velocity, if you know that the frequency of such wave is 150 Hertz.**

2) Calculate the wavelength for each of the following :

i. A longitudinal wave, the distance between its first and fourth rarefactions = 30 meter.

ii. A transverse wave, the distance between its successive crest and trough = 8 meter.

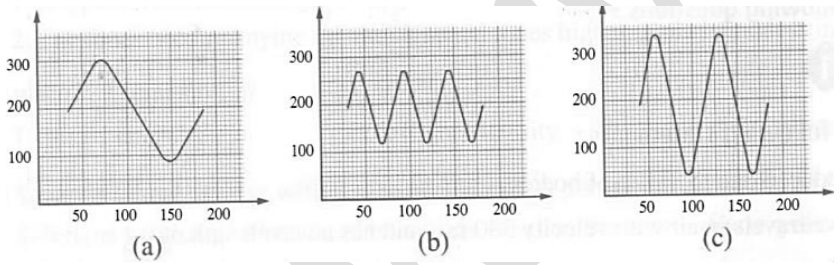
3) From the opposite figure find:

i. The largest amplitude

ii. The sharper tone

iii. The rough tone

iv. The higher intensity



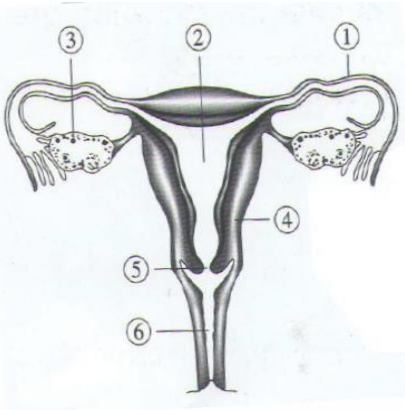
4) Look at the opposite diagram then answer the following:

i. What is the name of this system?

ii. Replace the numbers on the figure by the suitable labels.

iii. What is the organ which….?

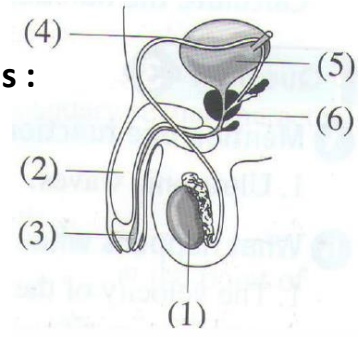
1. **Ova are produced**
2. **The ovum is fertilized**
3. **Fetus is growing**
4. **The embryo delivered to life**
5. **Secrete progesterone**



5) Look at the opposite figure , then answer the following questions :

i. What does the figure represent?

ii. Label the figure



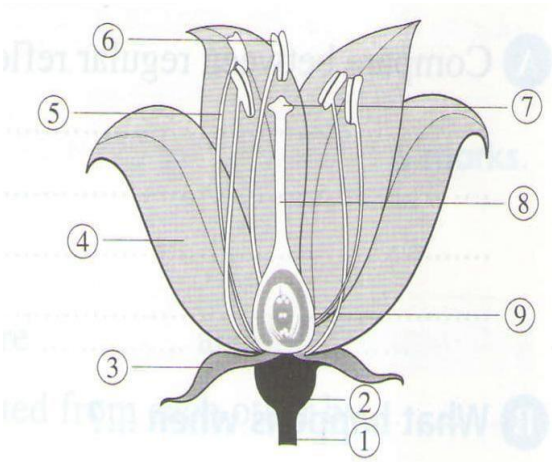
6) **Look at the opposite figure , then answer the following questions :**

i. **what is the sex of the flower**

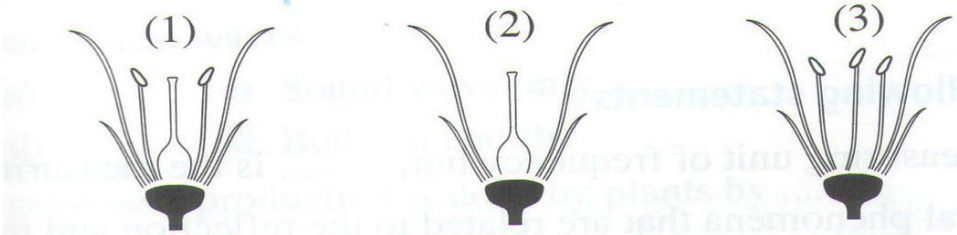
ii. **Label the figure**

iii. **The organ which consists of parts (7), (8) and (9)is called……..**

iv. **The organ which consists of parts 5 and 6 iscalled…….**



7) **Mention the sex in each flower from the following:**



8) **Calculate the frequency of a tone produced from savart's wheel when touching a gearof 30 teeth that rotates in 960 cycles in two minutes.**

9) **Savart's wheel rotates with a rate of 300 cycles per minute. A sound frequency 600 Hz isproduced when an electric plate touches teeth of gear. Calculate the number of the gear teeth.**

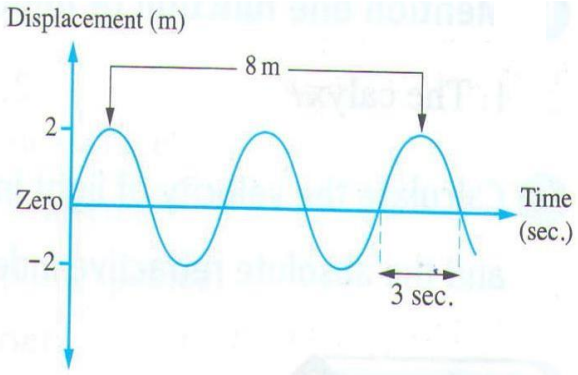
10) From the opposite, calculate :

e. wavelength

f. Frequency

g. Amplitude

h. Wave velocity



11) Calculate the absolute refractive index of diamond given that the speed of light throughit is 1.5×10^8 m/sec. knowing that the light velocity in air is 3×10^8 m/sec.

12) If the frequency of a sound wave is 200 Hz and the wavelength of this wave is 150 cm,calculate :

The velocity of sound waves propagation in air.

Model Answers

1) Complete the following statements:

1. Calyx-sepal
2. Androecium-gynoecium
3. Testosterone-estrogen
4. The female cell(Ovum)-zygote
5. Half-all
6. Cowper's – prostate
7. Estrogen – progesterone
8. A fruit – a seed
9. Filament – anther
10. Green – sepal
11. Zygote – 23
12. 28
13. Sepals – petals
14. Cutting, grafting and tissue culture
15. Sperm – testosterone
16. Androecium – gynoecium
17. Nucleus of sperm – nucleus of ovum
18. Head – tail
19. Fruits
20. Sperm – testis
21. A root – stem -tuber
22. High – low
23. Watt/m^2 – Decibel
24. Light speed
25. 20 – 20000
26. Regular reflection – irregular reflection
27. Strong – weak
28. Sharp – rough
29. Density of the medium – amplitude
30. 40°
31. 660 Hz
32. Refraction – normal
33. Mechanical
34. Real – apparent
35. Inversely – directly
36. Refractive index
37. Mirage - seeing objects higher than normal position
38. Broken
39. 65°
40. Doubled
41. The frequency of unknown tone
42. Frequency
43. Hertz – meter
44. 1
45. Crests – troughs
46. Compressions – rarefactions
47. Four
48. 600 sec.
49. Mechanical waves – electromagnetic waves
50. Sound
51. Time intervals
52. Simple harmonic motion
53. Mechanical
54. 0.24 sec.

2) Write scientific term for the following:

1. Flower
2. Calyx
3. Hermaphrodite
4. Stamens
5. Artificial pollination
6. testosterone
7. Corolla
8. Sacrotal sac
9. Zygote
10. Mixed pollination
11. Fertilization
12. Gynoecium
13. Male flower
14. Genital associated glands
15. Cutting
16. Tissue culture
17. Tissue culture
18. The fallopian tube
19. Chromosomes
20. Zygote
21. Light refraction
22. Infrasonic waves
23. Speed of light
24. Sound pitch
25. Sound intensity
26. Optical density
27. Mirage
28. Sound
29. Harmonic tones
30. Irregular reflection
31. Light reflection 1st law
32. Refraction angle
33. Sound inverse square law
34. Refraction angle
35. Periodic time
36. Amplitude
37. Frequency
38. Periodic time
39. The line of wave propagation
40. Periodic motion
41. Oscillatory motion
42. Rarefaction
43. crest

3) Choose the correct answer:

1. c
2. d
3. a
4. b
5. c
6. b
7. d
8. a
9. b
10. a
11. a
12. b
13. b
14. b
15. a
16. c
17. b
18. a
19. c
20. b
21. a
22. c
23. b
24. d
25. c
26. c
27. b
28. b

4) Correct the underlined word:

1. carpel
2. androecium
3. two testis
4. half
5. man
6. testis
7. asexual
8. progesterone
9. air
10. inflorescence
11. carpel
12. sperm
13. fallopian tube
14. cutting
15. Vas deferens
16. Equals to
17. Is more than
18. 20
19. Ultrasonic
20. Incidence
21. Longitudinal

5) What happens when?

1. It will germinate forming a pollen tube.
2. The sperm will die during passing through urethra.
3. The sperm will not have energy, so it will cannot move or attack the ovum.
4. No pregnancy will occur.
5. The pollen grain will not stick on stigma, and then pollen grain will not germinate.
6. The light rays are reflected in different directions (irregular reflection).
7. Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids.
8. The frequency will decrease to half since ($v = F \times \lambda$).
9. The light ray will reflect on itself.
10. The light ray will pass without any refraction.
11. The sound intensity will decrease to its quarter.
12. The velocity will increase to its maximum.

13. The kinetic energy = zero because the velocity at the maximum displacement =zero (K.E = ½ m v^2).
14. The light ray will refract away from the normal.

6) *What is meant by?*

1. It is the transfer of pollen grains from flower anthers to stigma.
2. It is the transfer of pollen grains from the anthers of a flower to the stigmas of the same flower.
3. It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in other plant of the same kind.
4. It is the type of pollination carried out by man like cutting, grafting, layering and tissue culture.
5. It is the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum) to form the zygote.
6. It is the cell resulting from the fusion of the nucleus of male cell (pollen grain) with the nucleus of female cell (ovum).
7. It is the flower which contains male reproductive organ (androecium) and female reproductive organ (gynoecium).
8. It is the process of multiplying a small part of a plant to get many identical parts.
9. It is the property by which the human ear can distinguish between sharp and rough sounds.
10. It is the property by which the human ear can distinguish between strong and weak sounds.
11. They are sound waves of frequencies ranges from 20 Hz: 20 KHz and can be heard by human ear.
12. It means that the ratio between the speed of light in air to the speed of light through water equals 1.33.
13. It is a natural phenomenon takes place on desert roads especially in the summer times where objects on the road side seems as if they have inverted image s on a wet area .
14. It is the angle between the emergent light ray and the normal at the point of emergence on the interface.
15. It is the rebounding of the light rays in the same medium on meeting a reflecting surface.
16. It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density.
17. It is the ability of the transparent medium to refract light.
18. It is the motion of the oscillating body around its rest point, where the motion is repeated through equal time intervals.

19. It is the disturbance that propagates and transfer energy in the direction of propagation.
20. It means that the frequency of the oscillating body = 1.6 Hz.
21. It means that the distance between the centers of two successive compressions or refractions = 30 cm.

7) Mention one use or function for the following:

1. Protects the inner parts of flower especially before blooming.
2. Stores the sperm.
3. Produces ovules.
4. Protects the reproductive organ of flower.
5. Produces and holds pollen grains.
6. Production of female sex hormone (estrogen and progesterone).
7. Receive the ripe ovum and direct it to the uterus.
8. Production of male sex hormone (testosterone).
9. It regulates and keeps the temperature of the two testis two degrees below the normal body temperature which is suitable for growth and development of sperms.
10. Contain one half of the genetic material.
11. It contains mitochondria which responsible for the Production of the energy needed for the sperm movement.
12. Responsible for the appearance of secondary sex characters in male.
13. Responsible for the appearance of secondary sex characters in female.
14. Responsible for the occurrence and continuity of pregnancy.
15. Secrete a seminal fluid which nourishes the sperm, facilitate the flow of sperms and neutralize the acidity of urethra.
16. Sterilization of water, food and milk - breaking down of kidney and ureter stones.
17. Used to treat sprains and cramps by using hot water – nervous tension by using cold water.
18. Used in radars.

8) Give reason for the following:

1. To attract insects which help in reproduction process.
2. To direct the ripe ovum towards the uterus.

3. Because the sacrotal sac regulates and keeps the temperature of the two testis two degrees below the normal body temperature which is suitable for growth and development of sperms.
4. Because some of them contain only male reproductive organ (androecium only) and the others contain only female reproductive organ (gynoecium only).
5. To stick on the insect body.
6. Because the sound of thunder is mechanical wave and the light of thunder is electromagnetic wave, where the speed of electromagnetic waves is much higher than speed of mechanical wave.
7. Because in barley plant, the anthers and stigmas are maturated at the same time , while in sunflowers the anthers and stigmas are not maturated at the same time.
8. To make easy movement till reaches the ovum..
9. Because the placenta is responsible for the nourishment of fetus (through umbilical cord) during pregnancy.
10. Because it has thick muscular wall that is rich in blood capillaries which feed the embryo and supply it with oxygen and also protect the embryo until birth.
11. Because the ovary of the peach contains only one ovule, so it contains only one seed.
12. .to neutralize the acidity of urethra, so the sperms don't die during passing through urethra
13. Because the incidence angle = reflection angle = zero.
14. Due to refraction lf light where the eye see the extension of the refracted rays.
15. Due to refraction lf light where the eye see the extension of the refracted rays.
16. Because the sound of man has low frequency (low pitched) and the sound of woman has high frequency (highly pitched).
17. Because the density of carbon dioxide is higher than that of air, and the sound velocity increases by increasing density of the medium.
18. Because light is electromagnetic waves which does not need a medium to propagate through.
19. Because the speed of light through air is larger than the speed of light in any other transparent medium.
20. Because ultrasonic waves have the ability to kill some types of bacteria and stop the action of some viruses.
21. Because its motion is not repeated on the two sides of its rest position.
22. Because its motion is around its rest point through equal time intervals.
23. Because the sound of solar explosions is a mechanical wave which need a medium to propagate through, while light is electromagnetic wave which can propagate through vacuum.

9) Compare between:

Points of comparison	calyx	corolla
Leaves	-Green leaves -Each leaf is called a sepals	-Colored and scented leaves -Each leaf is called petal
function	-It protects the inner part of the flower especially before blooming.	-It protects the male and female reproductive organs of flowers. -Attract insects which help in reproduction process.

Points of comparison	sperm	ovum
Size	small	Relatively large
Mobility	mobile	Static (not mobile)
The structure	Consists of head, midpiece and tail.	Consists of nucleus, cytoplasm and cellular membrane.
The number	The testis produce large number	Each ovary produces one ripe ovum every 28 days in exchange with the other ovary

Unisexual flowers	Bisexual flowers
Contain only male reproductive organ or female reproductive organ.	Contain both male and female reproductive organs.
Contain (3) whorls	Contain (4) whorls
Examples :palms, maize and pumpkin	Examples :tulip, petunia and wallflower

Points of comparison	Regular reflection	Irregular reflection
definition	It is the reflection of light rays when they fall on a smooth glistening surface, where the incident light rays are reflected in one direction.	It is the reflection of light rays when they fall on a rough surface, where the incident light rays are reflected in different direction.
examples	A plane mirror. A stainless steel sheet.	A leaf of tree A piece of paper

Points of comparison	The sound of lion	The sound of sparrow
Sound pitch	Low pitched	High pitched
frequency	Low frequency	High frequency
amplitude	Lower amplitude	Higher amplitude

Points of comparison	Infrasonic waves	ultrasonic waves
frequency	They are sound waves of frequencies less than 20 Hz	They are sound waves of frequencies higher than 20 KHz
examples	The waves accompany the storms that precede rain fall	Some animals such as bats, dogs and dolphins can hear ultrasonic waves

Points of comparison	Mechanical waves	Electromagnetic waves
definition	They are waves which need a medium to propagate through.	They are waves which don't need a medium to propagate through.
properties	They don't propagate through vacuum	They can propagate through vacuum
velocity	Their velocity is relatively low	Their velocity is great ($3x10^8$)
examples	They are • Transverse waves : (as water waves) • Longitudinal waves: (as sound waves)	They are all transverse waves as : -light waves -radio waves -x-ray

Points of comparison	Oscillatory motion	Wave motion
definition	It is the motion of the oscillating body around its rest point, where the motion is repeated through equal time intervals.	It is the motion produced as a result of the vibration of the medium particles at certain moment and in a definite direction.
examples	Pendulum motion Motion of spring	Sound waves Light waves

Points of comparison	Transverse wave	Longitudinal wave
Definition	Is the disturbance at which particles of the medium vibrate perpendicular to direction of wave propagation	Is the disturbance at which particles of the medium vibrate along to direction of wave propagation
Components	Crests and troughs	Compressions and rarefactions
Wavelength	The distance between two successive crests or troughs	The distance between the centers of two successive compressions or rarefactions.
examples	Water waves	Sound waves

10) What happens for each of the following after fertilization?

1. Becomes a fruit.
2. Becomes a seed.
3. Successive divisions to form the embryo.

11) Different types of questions:

1. a. number of waves = 2

   Wavelength = $\frac{(distance\ covered\ by\ the\ waves)}{number\ of\ waves} = \frac{20}{2}$ = 10 cm

   b. wave velocity = frequency x wavelength

   Wave velocity = 150 x 0.1 = 15 m/sec.

---

2. a. number of waves = 3

   Wavelength = $\frac{(distance\ covered\ by\ the\ waves)}{number\ of\ waves} = \frac{30}{3}$ = 10 meter

   b. wave length = *2 x the horizontal distance between the successive crest and trough*

   = 2 x 8 = 16 meter

---

3. a. (c)
   b. (b)
   c. (a)
   d. (c)

---

4. a. Reproductive organ of female.
   b. (1) → fallopian tube
      (2) → Uterus
      (3) → Ovary
      (4) → Uterus muscle
      (5) → Cervix
      (6) → Vagina

   c.
      i. Ovary
      ii. Top of fallopian tube
      iii. Uterus
      iv. Vagina
      v. Ovary

---

5. a. Reproductive organ of male
   b. (1) → Testis
      (2) → Penis
      (3) → Urethra
      (4) → Vas deferens
      (5) → Urinary bladder
      (6) → Prostate gland

---

6. a. Typical flower (hermaphrodite)
   b. (1) → Pedicle
      (2) → Receptacle
      (3) → Sepal
      (4) → Petal
      (5) → Filament
      (6) → Anther
      (7) → Stigma
      (8) → Style
      (9) → Ovary
   c. Carpel
   d. Stamen

---

7. (1) bisexual (hermaphrodite) flower
   (2) Female flower (unisexual)
   (3) Male flower (unisexual)

---

8. $Frequency = \frac{d\ (number\ of\ cycles) x\ n\ (number\ of\ teeth)}{t\ (time)}$

$Frequency = \frac{960\ X\ 30}{120} = 240$ Hz

9. $Frequency = \frac{d\ (number\ of\ cycles) x\ n\ (number\ of\ teeth)}{t\ (time)}$

$600 = \frac{300 \times n}{60}$ → 600 x 60 = 300 x n

Number of teeth (n) = 120 teeth

---

10. Wavelength = 4 m

Periodic time = 6 sec. → Frequency = $\frac{1}{6}$ Hz

Amplitude = 2m

Wave velocity = F x λ = $\frac{1}{6}$ x 4 = 0.6 m/sec.

---

11. Absolute refractive index of diamond = $\frac{Speed\ of\ light\ throgh\ air}{Speed\ of\ light\ through\ diamond}$

Absolute refractive index of diamond = $\frac{3\ x\ 10(8)}{1.5\ x\ 10(8)}$ = 2

---

12. Wave velocity (v) = frequency (f) x wavelength (λ)

v = 200 x 0.15 = 30 m/sec.

Questions

Unit (1)

(1) Write the scientific term:

1- It is a motion which is regularly repeated in equal periods of time.

2- It is the motion of oscillating body around its rest point, where the motion is repeated through equal intervals of time.

3- It is the maximum displacement done by the oscillating body away from its original position.

4- It is the motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction.

5- It is the time taken by an oscillating body to make one complete oscillation.

6- It is number of complete oscillations made by an oscillating body in one second.

7- It is the disturbance that propagates and transfers energy in the direction of propagation.

8- It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction.

9- It is the direction through which the wave propogate.

10- It is a disturbance in which the particles of the medium vibrate perpendicular to the direction of wave propagation.

11- It is the highest point of the particles of the medium in the transverse wave.

12- It is the lowest point of particles of the medium in the transverse wave.

13- It is a disturbance in which the particles of medium vibrate along the direction of wave propagation.

14- It is the area at which the particles of the medium are of highest density and pressure.

15- It is the area at which the medium particles are of lowest density and pressure.

16- It is the distance between two successive crests or troughs.

17- It is the distance between the centers of two successive compressions or rarefactions.

18- It is the maximum displacement achieved by the medium particles away from their rest positions.

19- It is the distance covered by the wave in one second.

20- It is the number of waves produced from the source in one second.

21- Simplest form of oscillatory motion.

(2) Give reason for:

1- The product of frequency and periodic time equals unity.

2- The oscillatory motion is considered as a periodic motion.

3- Water waves are transverse waves.

4- Sound waves are longitudinal waves.

5- Sound waves are mechanical waves, while radio waves are electromagnetic waves.

6- Hearing thunder after seeing lightning though they happen at the same time.

7- We can't hear the sound of solar explosions occurring on the sun, but we can see the light coming out of it.

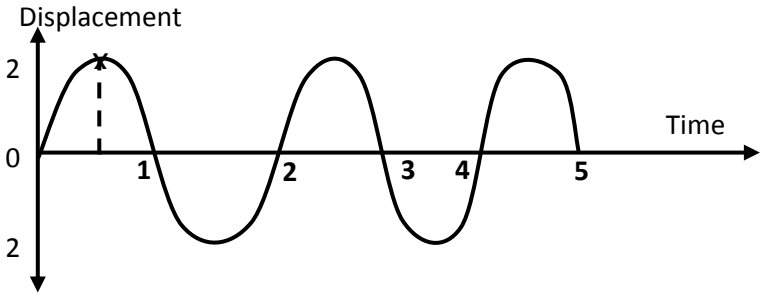
(3) Compare between:

1) Mechanical waves and electromagnetic waves.
2) Transverse and Longitudinal waves.
3) Oscillatory and wave motion.

(4) Problems:

1- From the opposite figure of the oscillatory motion of a simple pendulum, calculate:

a) Amplitude
b) periodic time
c) frequency



2- Calculate the periodic time and frequency for an oscillating body that makes 500 complete oscillations in two minutes.

3- Calculate the wave length in metre for a visible light wave of frequency 5×10^8 gigahertz and velocity of 3×10^8 m/s

4- A longitudinal wave is produced by a spiral spin such that the distance between the first and fourth compression is 24 cm find the wave velocity if the frequency of such wave is 20 kilo Hertz.

(5) What's meant by:

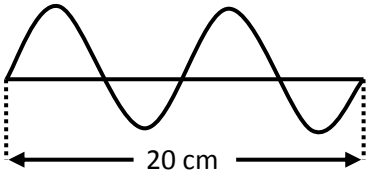
1- The time taken by spring to make 60 complete oscillations is 1 minute.
2- The frequency of simple pendulum is 50 Hz.
3- Wave length of sound wave is 30 cm.
4- Law of wave propagation.
5- Amplitude of vibrating source is 5 cm.
6- Wave length of transverse wave is 10 cm.

(6) Calculate the wavelength in metre for a visible light wave of frequency 5×10^8 Megahertz, and velocity of 3×10^8 m/s

(7) Problems:

1) A longitudinal wave is produced by a spiral spring such that the distance between the first and the fourth rarefactions is 18 cm.
Find the wave velocity if the frequency of such wave is 20 Hertz.

2) From the opposite figure,
calculate the velocity of the wave
if its frequency is 25 Hertz.



Important Laws:

1) Complete oscillation includes four amplitudes.

2) Periodic time = $\frac{time\ in\ seconds}{number\ of\ complete\ oscillations\ made\ in\ that\ time}$

3) Frequency = $\frac{number\ of\ complete\ oscillations}{time\ in\ seconds}$

4) Frequency (f) = $\frac{1}{periodic\ time\ (t)}$

5) Frequency × periodic time = 1

6) Wave velocity (v) = $\frac{distance\ covered\ by\ the\ wave\ in\ metres\ (m)}{time\ in\ seconds\ (s)}$

7) Wave length = $\frac{total\ distance\ covered\ by\ waves}{number\ of\ waves}$

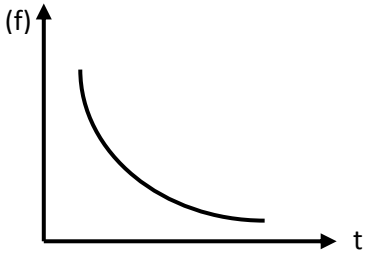
8) Wave velocity (v) = Frequency (f) × wave length (λ)

Important units:

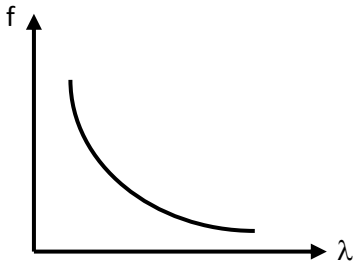
1) Amplitude → metre (m), centimeter (cm)
2) Periodic time → second (sec.)
3) Frequency → Hertz (Hz)
4) Kilo Hertz = 10^3 Hz
   Mega Hertz = 10^6 Hz
   Giga Hertz = 10^9 Hz
5) Wave length → metre (m)
   Millimeter = 10^{-3} metre
6) Wave velocity → $\frac{metre}{second}$ m/sec

Important graphs:

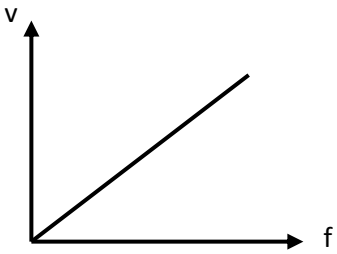
1) Relation between frequency and periodic time (inverse)



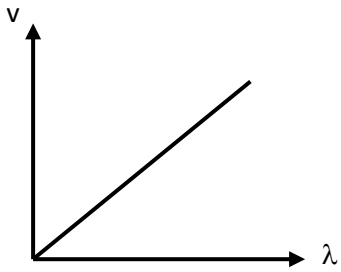
2) Relation between frequency and wave length (inverse)



3) Relation between velocity (v) and frequency (f) (direct)



4) Relation between velocity (v) and wave length (λ) (Direct)



Unit (2)

Lesson 1, 2

(1) Write the scientific term:

1) It is the distance which is covered by the sound waves in one second.
2) It is a property by which the ear can distinguish between rough and sharp voices.
3) It is the property by which the ear can distinguish between sounds either strong or weak.
4) The intensity of sound at a point varies inversely with the square of the distance between that point and the sound source.

$$I \alpha \frac{1}{d^2}$$

5) It's the property by which the human ear can distinguish between different sounds according to the nature of source even if they are equal in intensity and pitch.
6) They are sound waves of frequencies ranging from 20 Hz to 20 KHz
7) They are sound waves of frequency less than 20 Hz.
8) They are sound waves of frequencies higher than (20 KHz)
9) They are tone that accompany the basic tone, but they are lower in intensity and higher in pitch and differ from one instrument to another.
10) It is the return of sound waves in the same direction due to hitting a reflecting surface.
11) The angle of incidence = the angle of reflection

12) The incident sound ray, the reflected sound ray and the perpendicular line from the point of incidence on the reflecting surface all lie on the same plane, perpendicular to the reflecting surface.

13) It is the direction of the line of propagation of sound wave.

14) It is the angle between the incident ray and the perpendicular to the reflecting surface at the point of incidence.

15) It is the angle between the reflected sound ray and the perpendicular to the reflecting surface at the point of incidence.

16) It is a repetition of sound produced due to its reflection.

17) It is the collection of sound at a point due to its reflection on a concave surface.

(2) Give reason for:

1- We hear sound from all directions that surround the sound source.

2- Sound intensity increases when the sound source touches a resonance box.

3- Sound intensity in case of the presence of carbon dioxide gas as a medium is higher than that increase of air.

4- The human ear distinguishes between sounds from different sources even if they are equal in intensity and pitch.

5- The human ear can hear sounds of frequencies ranging from 20 to 20000 Hz.

6- Some sound waves can’t be heard.

7- Dogs can hear all sounds produced by man.

8- Man can’t hear sounds produced by dolphins.

9- When a sound ray is incident perpendicular to a reflecting surface, it reflects on itself.

10- Echo cannot be heard if the distance between the sound source and reflecting surface is less than 17 metres.

11- The voice of Imam can be heard clearly in all parts of large mosques without using microphones.

12- Fennec fox has large ability of hearing.

13- The ultra sonic waves can be used in detecting the industrial defects.

14- Bats can fly in the dark without colliding with any object.

15- A piece of moquette is put under the washing machine.

16- The time period between hearing the original sound and its echo should not be less than $\frac{1}{10}$ of second.

17- When you use Savart's wheel, you change the speed of wheel rotation.

18- The infrasonic waves are used for weather forecast.

19- Ultrasonic waves are used to sterilize food and water.

20- The ultrasonic waves have medical uses.

(3) Complete the following:

1- The velocity of sound through air depends on ……..., ……... , ……...

2- Sounds can be classified into two groups which ……..., ……..

3- The voice of women is ……...pitched as it is ……....

4- The voice of men is …….... pitched as it is ……....

5- As the sharpness of voice ……..., the level of voice (pitch) gets ……....

6- The sharp tones have ……...frequency, while the harsh tones have ……... frequency.

7- The frequency ……... by ……...the length of air column.

8- By increasing the ……... the frequency increase and the sound becomes ……...

9- The measuring unit of sound intensity is ……...

10- Noise intensity is measured in unit known as ……...

11- By increasing the amplitude 3 times the intensity of sound increases ……...

12- The string are fixed above an empty wooden box in guitar to ……...

13- Sound intensity is ……... proportional to the density of medium.

14- Types of sound waves ……... and ……...

15- Some animals such as ……..., ……...and ……... can hear ultra sonic waves.

16- The angle of ……... = the angle of reflection.

17- The human ear cannot distinguish between two successive sounds if the period between them is less than ……...

18- From the applications of echo ……..., ……..., ……... , ……...

19- Sonar set is used to produce ……... waves, while hydrophone set is used to ……... the ……... waves.

(4) Problem:

1) Calculate the wave length of a sound wave propagating through sea water with velocity 1500 m/sec knowing that its frequency is 10 kilo hertz.

2) Calculate the number of gear's teeth, if the wheel rotates with speed 180 cycles / minute and the frequency in Savart's wheel is 120 Hz.

3) A person stood at a distance of 660 metres from a mountain and produced a sound. He heard the echo after 4 sec. calculate the velocity of sound at that time.

4) A sailor produced a sound in sea, he heard its echo after 0.6 second. If the velocity of sound through water is 1435 m/sec. Calculate the depth of sea.

5) A person stood between two mountains and produced a sound. He heard two echoes after 2 and 3 seconds. If the velocity of sound through air is 340 m/sec find the distance between the two mountains.

6) Find the number of rotations in 2 minutes made by Savart's wheel producing sound of frequency 300 Hz, if a metallic plate touches one gear of 100 teeth.

Important laws:

1) Sound frequency (f) = $\frac{\text{number of cycles (d)}}{\text{time in seconds (t)}}$ × number of gear's teeth (n)

Savart's wheel is used to determine the frequency of an unknown tone.

2) Speed of rotation = $\frac{\text{number of rotation (turns)}}{\text{time (t)}}$

3) Inverse square law of sound

$I \propto \frac{1}{d^2}$

I : intensity of sound

D: distance between that point and the sound source

4) The velocity of sound (v) =

$$\frac{\text{twice the distance between the source of sound and the reflecting surface}}{\text{the average time of echo in seconds}}$$

$\therefore v = \frac{2\,d}{t}$

5) The depth of sea

Depth = $\frac{velocity\ of\ ultra\ sonic\ waves \times echo\ time}{2}$

$D = v \times \frac{t}{2}$

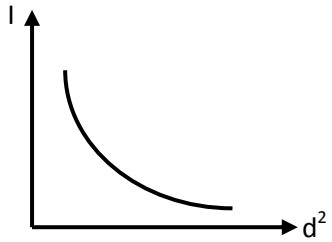
Important graphs:

1) The relation between intensity of sound and square distance.

Inverse square law of sound

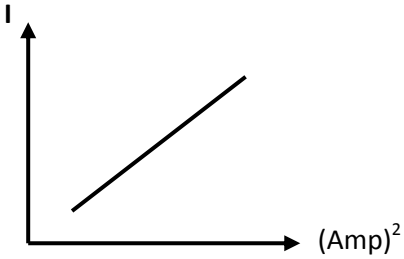
(Inverse relation)

$$I \propto \frac{1}{d^2}$$



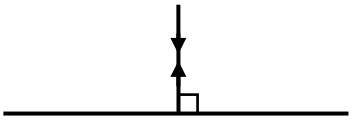
2) The relation between amplitude and intensity of sound.

(Direct relation)



3) Sound intensity is **directly proportional** to the density of medium which travels sounds.

4) When sound ray is incident perpendicular to a reflecting surface, it reflects on itself because the angle of incidence = angle of reflection = zero



Unit (2)

Lesson (3, 4)

(1) Write the scientific term:

1) It is the distance covered by the light in one second
2) It is the one of the components of electromagnetic spectrum of wave length ranges between 380 – 700 nanometres.
3) It is the splitting of white light into seven colours called spectrum colours.
4) It is the quantity of light falling perpendicular to a unit area of surface in one second.
5) The light intensity of surface is inversely proportional to the square of the distance between the surface and the source of light.
6) It is the returning back of light waves in the same medium on meeting reflecting surface.
7) It is the reflection of rays when they meet (fall on) a smooth (uniform) and glistening reflecting surface, where the incident light rays are reflected in one direction.
8) It is the reflection of light ray when they fall on a rough (non-uniform) reflecting surface, where the incident light rays are reflected in different directions.
9) It is a narrow beam which is represented by a straight line, it intersects with the reflecting surface at the point of incidence.
10) It is a narrow beam which is represented by a straight line that is reflected from the reflecting surface at point of incidence.

11) It is the angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence.
12) It is the angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence.
13) It is the change if light path when it travels from a transparent medium to another transparent medium of different optical density.
14) It is the ability of the transparent medium to refract the light.
15) It is the angle between the refracted light ray and the normal at the point of incidence on the interface.
16) It is the angle between the emergent light ray and the normal at the point of emergence on the interface.
17) It is the ratio between the velocity of light through air to the velocity of light through another transparent medium.
18) It is the angle of incidence of a light ray which travels from high optical dense medium to the lower one which results in it being refracted at 90° to the normal.
19) It is the return of light ray when it is incident in a medium of larger optical dense by an angle larger than the critical angle of this medium.
20) It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times where objects on the road sides seem as if they had inverted images on wet area.

(2) Compare between:

1) Transparent, translucent and opaque medium.
2) Regular and Irregular reflection.

(3) Give reasons for:

1) Although water is a transparent medium we cannot see fish at the bottom of the river Nile.
2) Book is an opaque medium.
3) The intensity of light increases four times when the distance between the light source and you decreases to its half value.
4) The incident light ray which falls perpendicular on a reflecting surface, reflects on itself.
5) The absolute refractive index of any transparent medium is always greater than one.
6) A pencil which is partially immersed in water appears as being broken.
7) The sub merged object in water is seen in an apparent position slightly above its real position.
8) To pick up a coin which has fallen in a deep beam we must look at it vertically.
9) Light can travel through free space.
10) Formation of spectrum colors.
11) The energy of real light photon is less than that of orange light photon.
12) The energy of violet photon has the maximum energy in spectrum colours.
13) The optical density of a medium differs from a medium to another.
14) When light ray travels from air to water it refracts near the normal.
15) Sometimes, when light ray is incident in transparent medium, it refracts tangent to the separating surface.
16) Occurrence of total internal reflection in a transparent.
17) Occurrence of mirage phenomenon in desert regions at noon.

(4) Mention used for:

1) Periscope 2) Optical fibers 3) Light

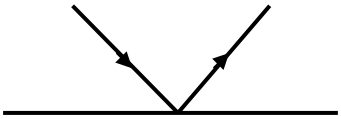
Important laws:

1) Energy of photon = planck's constant × frequency of photon

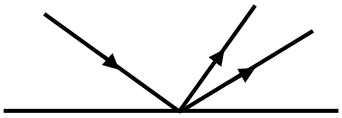
2) Absolute refractive index of medium = $\frac{velocity\ of\ light\ through\ air}{velocity\ of\ light\ through\ medium}$

Important drawing:

(1)

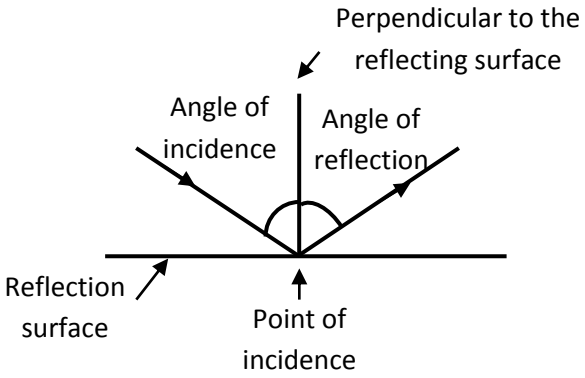


Regular reflection



Irregular reflection

(2) Reflection



(3) Light ray travels from:

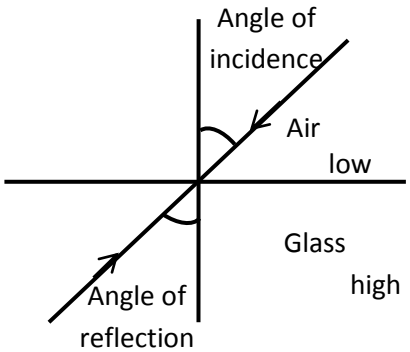
Medium (1) < medium (2)

Lower than

In optical density it refracts

- near the normal
- angle of incidence is > angle of refraction

a greater than



(4) Light travels from:

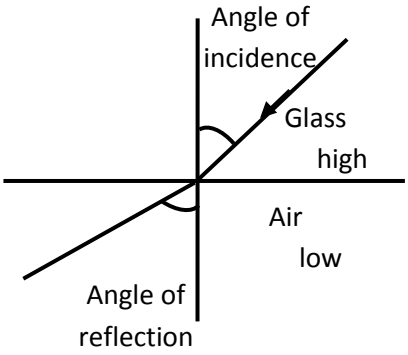
Medium (1) > medium (2) in

greater than

- optical density, it refracts far from the normal.

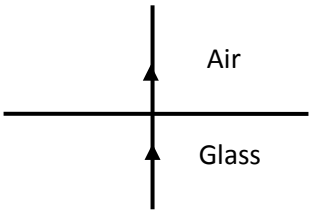
→ angle of incidence is < angle of refraction

less than

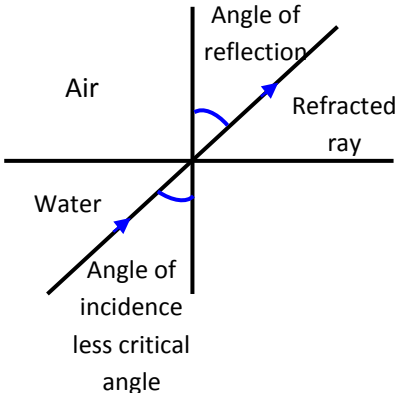


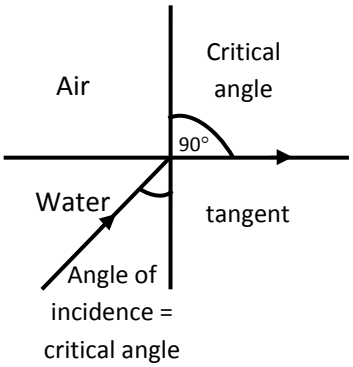
Note: glass > water > Air in optical density

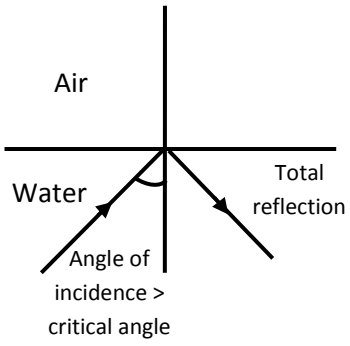
(5) light ray falls perpendicular it pass the other medium without refraction



(6) Critical angle and total internal reflection Air





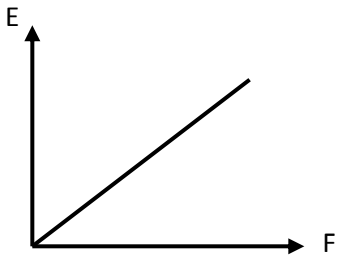


Important graphs:

(1)

- relation between energy frequency of light wave

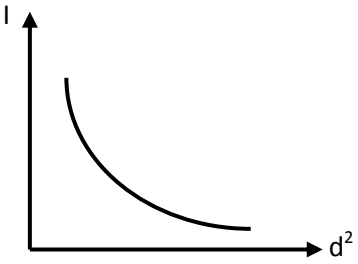
Directly



(2)

- inverse square

law of light

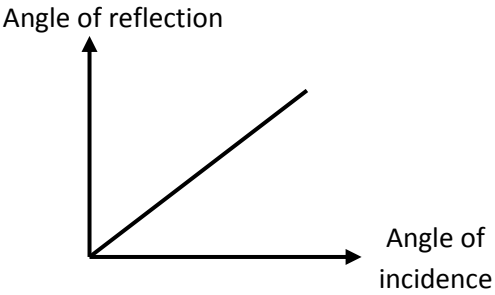


(3)

- Relation between angle of reflection &

angle of incidence

(Direct)



Unit (3)

(1) Write the scientific term for each of the following:

1- Short stem where the leaves developed and modified into reproductive organs. (……..)

2- An organ in a flower that consists of an ovary, a style and stigma. (……..)

3- The flower that contains both pistils and stamens. (……..)

4- Small particles that spread in the air to fertilize the ovules in plants. (……..)

5- A plant which is pollinated by man. (……..)

6- A plant structure that changes into a seed after fertilization process. (……..)

7- New techniques the kind of seeds to obtain desirable traits. (……..)

8- A group of green leaves in flowers, each of them is called a sepals. (……..)

9- The male reproductive organ in a flower. (……..)

10- Fluid secreted by sexual glands. (……..)

11- Funnel shaped tube lined with cilia. (……..)

12- Female organ that pear shaped with thick elastic muscular walls. (……..)

13- The time between infection of microbes and appearance of symptoms. (……..)

14- The cell formed due to combination of sperm and ovum. (……..)

15- Male hormone secreted by testis. (……..)

(2) Complete:

1- The flower arises from a floral ……., which emerges from the axial of a leaf called …….

2- The corolla attracts ……. to the flower which helps in ……. process.

3- Each stamen consists a fine ……. ending in a sac known as the …….

4- Types of pollination are ……. pollination and ……. pollination.

5- After fertilization, the ovary grows forming the ……. while the ovule converts into the …….

6- Hermaphrodite flowers take the symbol ……., while male flower take the symbol …….

7- The cut is a part of ……., stem or …….

8- The human male reproductive system consists of ……., two vas deferens ……. and penis.

9- Each test is connected to a group of fine convoluted tubes known as ……. which extends in the form of single tube known as …….

10- The ……. hormone in males and ……. hormone in female are responsible for the appearance of secondary sex characters.

11- The menstrual cycle starts at age in female ……. and stops at the age of …….

12- The two fallopian tubes are open in the ……. corners of the …….

13- The sperm consists of ……., middle part and …….

14- The middle part of the sperm contains ……. responsible for energy production needed for the sperm.

15- ……. and ……. are examples of genital diseases which don't arise from sexual contact.

(3) Choose the correct answer:

1- The flower a modified …….

a) stem b) leaf c) root d) branch

2- The floral leaves of typical flower are arranged in whorls ……

a) two b) three c) four d) five

3- ……. products pollen grains.

a) carpel b) style c) stamen d) petal

4- In the flower, the organ which produces ovules is the …….

a) anther b) receptacles c) ovary d) calyx

5- All of the following are unisexual flowers except …….

a) tulip b) palm c) maiz d) pumpkins

6- Sexual reproduction in plants take place in …….

a) seeds b) corolla c) calyx d) vegetative parts

7- Mixed pollination in plant trees is carried out by …….

a) insects b) seeds c) air d) water

8- After fertilization, the ovary develops forming the …….

a) seed b) flower c) fruit d) leaf

9- Grafting by attachment can be carried to the ……. trees.

a) grape b) sugarcane c) rose d) mango

10- Tissue culture is process of multiplying small parts of plant to get many ……. parts.

a) different b) similar c) identical d) small

11- All of the following are parts of male reproductive system except

a) vas defense b) uterus c) testes d) penis

12- The right ovary in the female human produces a mature (ripe) ovum every ……. days.

a) 24 b) 28 c) 34 d) 56

13- ……. hormone is responsible for the occurrence and continuity of pregnancy.

a) Estrogen b) Testosteron c) Progesterone d) Thyroxin

14- The ……. is a muscular tube that expands during the labour.

a) uterus b) vagina c) ovary d) fallopian tube

15- Chromosomes carry ……. which are responsible for the hereditary traits of the species.

a) rhibosomes b) centrioles c) genes d) centrosome

16- The head of sperm secretes ……. to dissolve the cellular membrane of ovum.

a) hormones b) semen c) fluids d) enzymes

17- Fertilization occurs when ……. is formed.

a) embryo b) zygote c) ovum d) endometrum

18- The first stage of human embryo development takes ……. weeks.

a) 5 b) 6 c) 7 d) 8

(4) Give reason for:

1- The petals of corolla are colorful and scented.

2- The gynoecium is the female reproductive organ of the flower.

3- Palm flowers are unisexual.

4- Auto pollination can't happen in sunflowers.

5- The stigma of air pollinated flowers are feathery like and sticky.

6- Flowers pollinated by insects produce coarse pollen grains.

7- Tissue culture is a good method for plant reproduction.

8- Man can't reproduce a sexually.

9- The presence of testes outside the body in a sac-like structure called the scrotal sac.

10- The seminal fluid is alkaline.

11- The uterus is suitable organ for growth the embryo.

12- The mother can feel the movement of her fetus starting from the third stage of fetus development.

Model Answers

Unit (1)

(1) Write the scientific term:

1- Periodic motion
2- Oscillatory motion
3- Amplitude
4- Complete oscillation
5- Periodic time
6- Frequency
7- Wave
8- Wave motion
9- Line of wave propagation
10- Transverse wave
11- Crest
12- Trough
13- Longitudinal wave
14- Compression
15- Rarefaction
16- Wave length (λ) of transverse wave
17- Wavelength of longitudinal wave
18- Amplitude of wave
19- Wave velocity
20- Wave frequency
21- Simple harmonic motion

(2) Give reason for:

1- Because the frequency is inversely proportional to the periodic time

where: Frequency = $\frac{1}{periodic\ time}$

2- Because the motion of oscillating body is repeated through equal intervals of time.

3- Because the water particles vibrate in a direction perpendicular to the direction of wave propagation.

4- Because the medium (air) particles vibrate along the direction of waves propagation.

5- Because sound wave need a medium to propagate and they don't propagate through vacuum while radio waves don't need medium to propagate.

6- Because the light of lightning is from electromagnetic waves, while the sound of thunder is mechanical waves, where the speed of electromagnetic waves is much greater than the speed of mechanical waves.

7- Because the sound is mechanical waves which need a medium to propagate through while the light is electromagnetic waves which can propagate through vacuum.

(3) Compare between:

1) Mechanical waves and electromagnetic waves.

Mechanical	Electromagnetic
1- They need medium to propagate.	2- They do not need medium to propagate.
2- They don't propagate through vacuum (free space)	2- They propagate through vacuum (free space)
3- They are transverse waves or longitudinal waves.	3- They are all transverse waves.
4- Their speed is relatively low. Examples: sound waves (longitudinal) – water waves (transverse)	4- Their speed is great the speed of light = 3×10^8 m/sec Examples: light waves – radio waves (used in radars)

2) Transverse and Longitudinal waves

Point of comparison	transverse	Longitudinal
1- Definition	It is a disturbance in which the particles of medium vibrate perpendicular to the direction of wave propagation.	It is a disturbance in which the particles of medium vibrate along the direction of wave propagation.
2- Composition	crests and troughs	compressions and rarefactions
3- Examples	water waves	Sound waves

3) Oscillatory and wave motion

Points of comparison	Oscillatory	Wave
1- Definition	- it is the motion that is produced by oscillating body at the two sides of its original position.	- It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction.
2- Velocity	- is maximum when the oscillating body passes its rest position. - is minimum when it goes far from its rest position.	- the wave has a definite velocity along the direction of propagation.
3- Examples	- Pendulum motion - motion of spiral spring	- sound waves as mechanical longitudinal wave. - light waves as electro-magnetic transverse waves.

(4) Problems:

1- a) Amplitude (x) = 2 cm

b) periodic time (t) = 2 seconds → time of oscillation

c) frequency (f) = $\frac{1}{t} = \frac{1}{2}$ = 0.5 Hz

2- T = 2 × 60 = 120 seconds

Periodic time = $\frac{time\ (t) seconds}{No.of\ complete\ oscillations}$

= $\frac{120}{500}$ = 0.24 seconds

Frequency = $\frac{1}{t} = \frac{1}{0.24}$ = 4Hz

3- Frequency = $5 \times 10^8 \times 10^9 = 5 \times 10^{17}$ Hz

Wave length (λ) = $\frac{wave\ velocity\ (v)}{frequency\ (f)} = \frac{3\times10^8}{5\times10^{17}}$ = 0.6×10^{-9} metre

4- 3 waves are formed between the first and fourth rarefactions

∴ 4 – 1 = 3

∴ Wave length (λ) = $\frac{24}{3}$ = 8 cm = 0.08 m

Frequency (f) = 20×10^3 Hz.

∴ Wave velocity (v) = wave length (λ) × wave frequency

= $0.08 \times 20 \times 10^3$ = 1600 m/sec

(5) What's meant by:

1- The periodic time of spring is $\frac{60}{60}$ = 1 sec.

2- Number of complete oscillation made by pendulum in one sec is 50 complete oscillations.

3- Distance between centers two successive comprssions or centers of 2 successive rarefactions is 30 cm.

4- Law of wave propagation.

V = F × λ

v : velocity of wave

F: frequency of wave

λ: wave length of wave

5- Maximum displacement achieved by medium particles away from their rest positions is 5 cm.

6- Distance between two successive crests or two successive troughs in such wave is 10 cm.

(6) Calculate the wavelength in metre for a visible light wave of frequency 5 × 10^8 Megahertz, and velocity of 3 × 10^8 m/s

Frequency= 5 × 10^8 × 10^6 = 5 × 10^{14} Hz

Wavelength (λ) $= \frac{\text{wave velocity (V)}}{\text{Frequency (F)}} = \frac{3\times10^8}{5\times10^8}$

= 0.6 × 10^{-6} = 6000 × 10^{-10} metre.

(7) Problems:

1) A longitudinal wave is produced by a spiral spring such that the distance between the first and the fourth rarefactions is 18 cm.
Find the wave velocity if the frequency of such wave is 20 Hertz.

Solution:

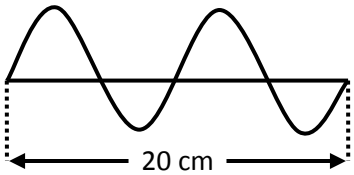
3 waves are formed between the first and fourth rarefactions.

$\therefore$ Wavelength (λ) = $\frac{18}{3}$ = 6 cm = 0.6 cm = 0.06 m

$\therefore$ Wave velocity (V) = Wavelength (λ) × Wave frequency (F)

= 0.06 × 20 = 1.2 m/sec.

2) From the opposite figure, calculate the velocity of the wave if its frequency is 25 Hertz.



Solution:

The figure shows two waves of length 20 cm.

$\therefore$ The wavelength (λ)= $\frac{20}{2}$ = 10 cm = 0.1 m

$\therefore$ Wave velocity (V) = Wavelength (λ) × Wave frequency (F)

= 0.1 × 25 = 2.5 m/sec

Unit (2)

Lesson 1, 2

(1) Write the scientific term:

1) Sound velocity
2) Sound pitch
3) Sound intensity
4) Inverse square law of sound
5) Sound quality (type)
6) Sonic waves
7) Infra sonic waves
8) Ultrasonic waves
9) Harmonic tones
10) Sound reflection
11) First law of sound reflection
12) Second law of sound reflection
13) Sound ray
14) Angle of incidence of sound ray
15) Angle of reflection
16) Echo
17) Concentration of sound

(2) Give reason for:

1- Because the sound travels through air as pulses of compressions and rarefactions whose centre is the sound source.
2- Due to the increase of the surface area of vibrating body.
3- Because the density of carbon dioxide gas is more than that of air since the intensity of sound is directly proportional to density of medium.
4- Due to the harmonic tones that associate the fundamental tone of the source of sound and are lower in intensity and higher in pitch.
5- Because the ear transmits the effect of these waves to the brain which translates them into sound and audible tones.

6- Because the frequencies of these waves are lower than 20 Hz or more than 20000 Hz, so the human ear cannot hear them as the effects of such waves cannot be translated by the brain into audible tones.

7- Because man produces sounds of frequencies less than 20 kilo Hertz and dogs can hear sounds up to 50 kilo Hertz.

8- Because dolphins produce sounds up to 120 kilo hertz, while man can hear sounds of frequencies up to 20 kilo hertz only.

9- Because the angle of incidence = the angle of reflection = zero.

10- Because the time between hearing the main sound and its echo will be less than $\frac{1}{10}$ of a second and the human ear cannot distinguish between the two successive sounds.

11- Because the surface of large mosques are concave which concentrate the reflected sound waves and make the sound more clear and more intense.

12- Because it has large and concave ear pinna that concentrate the reflected sound and make it more clear and more intense.

13- Because the waves reflected from the areas which contain air bubble have a different intensity than those reflected from well welded areas.

14- Because they produce ultra sonic waves that reflect on the surface and barriers then receive them back and locate their positions, thus the avoid colliding with them.

15- To absorb the noise produced due to vibration instead of its reflection from the glistening surfaces of walls.

16- Because the human ear cannot distinguish between two successive sounds if the period between them is less than 0.1 sec.

17- To change the frequency of the produced sound.

18- Because these waves accompany the blowing of storms that preceding rainfall.

19- Because they have high ability to kill some types of bacteria and stop the action of some viruses.

20- Because they are used for breaking down of kidney and ureter's stones and also for diagnosis of male prostate tumors.

(3) Complete the following:

1- temperature of air, air pressure , the humidity in air.

2- musical tones, noise.

3- high - sharp.

4- low - rough.

5- increase - higher.

6- high - low

7- increases - decreasing

8- speed of rotation - high pitched (sharp).

9- watt /m^2

10- decibel.

11- 9 times.

12- increase the sound intensity.

13- directly

14- audible - non audible.

15- bats, dogs - dolphins

16- incidence

17- 0.1 sec.

18- determination of the velocity of sound through air, detecting industrial defects, medical diagnosis, concentration of sound.

19- ultrasonic - receive - reflected

(4) Problem:

1) Velocity (v) = frequency (f) × wave length (λ)

Frequency = 10 kilo hertz = 10×10^3 Hz

$\therefore$ wave length = $\frac{v}{f} = \frac{1500}{10^4}$ = 0.15 m= 15 cm

2) F = 120 Hz

Speed of rotation = 180 cycles\minute

Time = 1 minute = 1 × 60

$\therefore$ Frequency (f) = $\frac{\text{number of cycles (d)}}{\text{time in seconds}}$ × number of gear's teeth (n)

120 = $\frac{180}{1\times60}$ × no of gear's teeth (n)

$\therefore$ Number of gear's teeth = $\frac{60\times120}{180}$ = 40 teeth

3) v = $\frac{2\,d}{t} = \frac{2\times660}{4}$ = 330 m/sec

4) d = $\frac{tv}{2} = \frac{0.6\times1435}{2}$ = 430.5 m

5) The distance between the person and the first mountain = $\frac{v\,t_1}{2}$

= $\frac{340\times2}{2}$ = 340 m

- the distance between the person and the second mountain = $\frac{v\,t_2}{2}$

= $\frac{340\times3}{2}$ = 510 m

- the distance between two mountains = 510 + 340 = 850 metres

6) Frequency = $\frac{No.of\ rotations\times\ no.of\ gear's\ teeth}{time\ (in\ seconds)}$

300 = $\frac{No.of\ rotations\times100}{2\times60}$

No of rotations = $\frac{300\times2\times60}{100}$ = 360 rotations

Unit (2) Lesson (3, 4)

(1) Write the scientific terms:

1) The speed of light
2) The visible light
3) Analysis of white light
4) Light intensity
5) The inverse square law of light
6) Light reflection
7) Regular (uniform) reflection
8) Irregular (non-uniform) reflection
9) The incident light ray
10) The reflected light ray
11) Angle of incidence
12) Angle of reflection
13) Light refraction
14) Optical density of medium
15) The angle of refractio
16) The angle of emergence
17) Absolute refractive index of medium
18) Critical angle
19) Total internal reflection
20) Mirage

(2) Compare between:

1) Transparent, translucent and opaque medium.

Transparent medium	translucent medium	opaque medium.
- permits most light to pass through - objects can be seen clearly through it. - Ex: Air – glass cup	- permits only a part of light to pass through and absorb the remaining part. - objects can be seen through translucent medium less clearly than the transparent one. - Ex: tissue paper – flint glass	- doesn't permit light to pass through. -objects can't be seen through opaque medium. - Ex: foil paper – milk – wood - cartoon

2) Regular and Irregular reflection

Regular reflection	Irregular reflection
- light fall on smooth surface - incident light ray are reflected in one direction	- light fall on rough surface - incident light ray are reflected indifferent directions (scattring)

(3) Give reasons for:

1) Because the thickness of water at that point (bottom) is larger enough to prevent light to pass through.
2) Because it doesn't permit light to pass through and objects can't be seen behind it.
3) Because is light intensity is inversely proportional to the square of the distance between them.
4) Because the angle of incidence and the angle of reflection equal zero.
5) Because the velocity of light through air is always greater than that through any other transparent medium.
6) Due to the refraction of light rays coming from the immersed part in water.
7) Due to the refraction of light rays coming from the object away from the normal where, the eye sees the extensions of these refracted rays.
8) Because the incident light ray perpendicular to the interface between air and water, it passes without refraction so the apparent position is the real position.
9) Because it is electromagnetic waves which do not need medium to travel through.
10) Due to splitting of white light into seven spectrum colours.

11) Because the frequency red light is less than that of orange light and the energy is directly proportional to the frequency.
12) Because it has the maximum frequency in spectrum colors.
13) Because velocity of light changes from one transparent medium to another.
14) Because air is a transparent medium of lower optical density than water.
15) Because the angle of incidence equals critical angle of the transparent medium.
16) Because the angle of incidence is more than the critical angle of the medium.
17) Due to occurrence of a several refractions then total internal reflections in the different air layers in density and temperature.

(4) Mention used for:

1) Periscope:

a- Used in submarines to see what is going on the water surface.
b- To see events happening behind a wall
c- to monitor the dangerous chemical reactions in laboratory.

2) Optical fibers:

Used in medicine as they are used in manufacture of medical endoscopes used by doctors to diagnose some diseases and visualize injury inside the body.

3) Light:

Is used in home decorations like spot light to illuminate artifacts and stand lamps that concentrate light for reading.

Unit (3)

(1) Write the scientific term for each of the following:

1- flower
2- gynoecium
3- Bisexual flowe
4- pollen grains
5- palm trees
6- ovule
7- Tissue culture
8- calyx
9- Androecium
10- seminal fluid
11- fallopian tube
12- uterus
13- Incubation period
14- zygote
15- Testosterone

(2) Complete:

1- bud – bract
2- insects - pollination
3- filament – anther
4- self pollination – mixed pollination
5- fruit – seed
6- ♀ - ♂
7- Root – leaf
8- two testes – genital glands
9- Epididymis – vas deferens
10- Testosterone – Estrogen
11- 11.14 – 45.55
12- upper – uterus
13- the head – the tail
14- mitochondria
15- Gonorrhea - syphilis

(3) Choose the correct answer:

1- leaf
2- four
3- stamen
4- ovary
5- tulip
6- seeds
7- insects
8- fruits
9- mango
10- identical
11- uterus
12- 28
13- progesterone
14- vagina
15- genes
16- enzymes
17- zygote
18- 6

(4) Give reason for:

1- To attract insects to make pollination.

2- Because it produces ovules which is the female reproductive cells.

3- Because palm trees may be male trees or female trees.

4- Because anther and stigma of sunflower plant never grow at the same time.

5- To catch a large number of pollen grains to make pollination.

6- To stick on the insect body to make pollination.

7- Because it can produce a huge number of identical plants with good traits, and get many identical parts from a small part of the plant.

8- Because the individuals coming from a sexual reproduction are identical to their parents, while the human, each individuals differ from others.

9- To regulate and keep the temperature of testes two degree below the normal body temperature which is suitable temperature for the growth and development of sperms.

10- To neutralize the acidity of urethra.

11- Because it has thick muscular wall that is rich in blood capillaries which feed the embryo and supply it with oxygen and it also protects the embryo until birth.

12- Due to the strength of the embryo muscles which help in movement.

Science 2nd Prep.

Last Look

Second term

By:Mr.Mohamed Taha

1) Choose the correct ansewr:-

1- The production of mango occurs by: (cutting – grafting – tissue culture)
2- The sound waves that accompany the blowing of storms are …… waves
(Sonic – ultrasonic – infrasonic)
3- The conversion of sound at a point due to its reflection on a concave surface is called …..
(Echo – concentration of sound – sound velocity)
4- The measuring unit of sound intensity is: (Watt/m^2 – Hertz – Decibel)
5- The human skin is considered a/an ……. Medium:
(Transparent – opaque – translucent)
6- The right ovary in the human female produces a mature ovum every …… days:
(28 – 34- 56)
7- The human ear can distinguish between sounds of frequency ……
(50 KHz – 300 Hz – 25 KHz)
8- Light waves are …. Waves:
(Mechanical transverse – electromagnetic longitudinal – electromagnetic transverse)
9- The typical flower consists of ….. floral whorls: (4 – 3 – 5)
10- The quantum of energy of green light is …… the quantum of energy of yellow light.
(Greater than – equal to – less than)
11- The complete oscillation includes ….. displacement/s (One – two – three – four)
12- The electric bell produces pluses of ……..
(Compressions and rarefactions – crests and compressions – troughs and rarefactions – crests and troughs)
13- The bones of embryo start to develop in the …… stage of human embryo development
(First – second – third – fourth)
14- If the angle of incidence of a light ray is 60, so the angle of reflection equals …….
(30 – 60 – 120 – 15)
15- When the distance between the sound source and the ear is doubled, the sound intensity … (Decreases to its half – increases twice – increases four times – decreases to its quarter)

2) Writ the scientific term :

1- It is the repetition of sound produced due to its reflection
2- Short stem where the leaves developed and modified into reproductive organs
3- The process of fusion of pollen grains with the ovum to form the zygote
4- The maximum displacement done by the oscillating body away from its original position
5- Sound waves of frequencies less than 20 Hz
6- It is an external factor which affects the eye causing the sense of vision
7- The time needed by an oscillating body to make a complete oscillation
8- A fundamental tone associated by other tones higher in the pitch and less in intensity
9- The amount of the light incident normally into a unit area of a surface in one second
10- A disturbance that propagates and transfers energy along the direction of propagation.
11- The return (recoil) of a light ray when it is incident in a medium of larger optical density by an angle larger than critical angle for this medium.
12-Two glands that produce the female cells in human females
13- The distance between two successive crests or troughs
14- Tones of uniform frequency and comfortable to be heard
15- The measuring unit of the noise intensity
16- The innermost whorl of a male flower
17- An oval shaped gland that produces male cells
18- The collection of sound at a point due to its reflection on a concave surface.
19- The reproduction of some plants by parts of the roots, stem or leaves.
20- A mixture of seven colors that form the white light.
21- The stage of embryo development which starts from the beginning of 25^{rd} week till delivery.
22- A property of sound by which the ear can distinguish between weak and strong sounds.
23- Wave velocity = frequency × **wavelength**
24- They are small green leaves surrounding the flower from outside.
25- The flower that contains male and female reproductive organs.
26- It is the light wave from components of electromagnetic spectrum.
27- Angle of incidence = Angle of reflection
28- A new method to produce large numbers of plants from a small part of it.
29- A sac lies outside the male body and contains the testes.
30- A medium does not allow light rays to pass through it.

3) Compare between:

1- Longitudinal wave and transverse wave
2- Mechanical and electromagnetic waves
3- Self pollination and cross pollination
4- Sperm and ovum (with drawing)
5- Sonic waves and ultrasonic waves
6- Transparent, translucent and opaque media.
7- Puerperal sepsis and syphilis.

4) What are the conditions should be found to hear the echo?

5) Complete the following statements:

1- A complete oscillation comprises……..successive displacements, each of which is called……

2- Sound intensity at a certain point is……proportional to the square of the distance between this point and the sound source, and is……. proportional with the square of the amplitude.

3- When you look at a coin in a glass of water, it's…….position appears to be lower than the …….position.

4- Hermaphrodite flowers take the symbol…….while male flowers take the Symbol ……

5- The resonance box ……..…….. the area of vibrating surface.

6- Mango trees reproduce by …….. but sugar cane reproduce by ……

7- The frequency of vibrating string is …….. Proportional to its length.

8- …….. of pendulum is directly proportional to its length.

9- From the examples of oscillatory motion is the ……..

10- Jacuzzi is used to treat sprains and cramps by using …….. water.

11- Sonar set produces ……. Waves whose frequency is more than ……..

12- …… , …… and ……. Are components of sperm

13- ……. And …… are examples of genital diseases which don't arise from sexual contact

14- Radio waves are considered …… waves that propagate through …… with velocity ……

15- Harmonic tones are lower in …… and higher in ……..

16- Before delivery, the embryo position changes gradually to be ……. Where the head is directed towards the ……

6) Give reasons :

1- Ultrasonic waves are used for sterilization of food

2- Olive fruit contains one seed

3- We must not use metallic cooking pots in the microwave

4- Auto pollination can't happen in sunflower

5- Oscillatory notion is considered as a periodic motion

6- The energy of red light photon is less than that of orange light photon

7- Sound can be heard from all surrounding directions.

8- The difference in frequency between the musical note and noise.

9- The absolute refractive index for any transparent medium is larger than 1.

10- A new mother should avoid air currents after delivery.

11-We see lightning before hearing thunder.

12- If a sound ray is incident perpendicular to a reflecting surface, it reflects on itself.

13- The product of frequency and periodic time equals one.

14- Bats can determine the position of their preys.

15- Pea fruit contains more than one seed.

16- Fallopian tube is lined with cilia.

17- The uterus is a suitable organ for the growth of embryo.

18- The sound can be heard from all direction.

7) Mention the function of :

1- Sonar set 2- Savart's wheel 3- The mid piece of a sperm 4- Optical fibers
5- Ultrasonic waves 6- Scrotal sac 7- Testosterone hormone 8- Fallopian tube
9- Jacuzzi (physiotherapy tubes) 10- Radio waves 11- Corolla 12- Two testes
13- Triangular glass prism 14- Seminal fluid 15- Two ovaries
16- The vas deferens 17- Estrogen and progesterone hormones

8) Problems :

1- Calculate the periodic time for an oscillatory body that makes 600 complete oscillations in one minute.

2- Savart's wheel rotates with 300 cycles per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of the gear. Calculate the number of the teeth of the gear.

3- A person stood at a distance of 680 meters from a mountain and produced a sound, he heard the echo after 4 sec. Calculate the velocity of sound at that time.

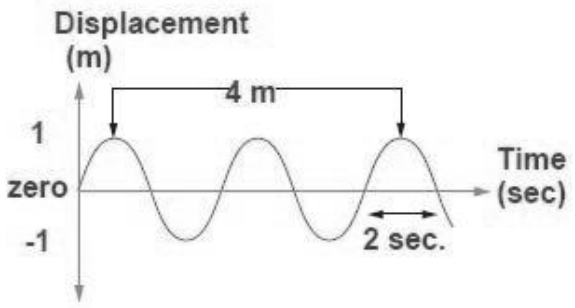
4- An ultrasonic wave is produced by a ship. The wave hit the seabed and returned back after 0.1 of second. Calculate the depth of sea, given that the velocity of such wave through water is 1490 m/sec.

5- Calculate the wavelength of a sound wave propagates in sea water with velocity 1500 m/sec, knowing that the frequency of the wave is 10 kilo Hertz.

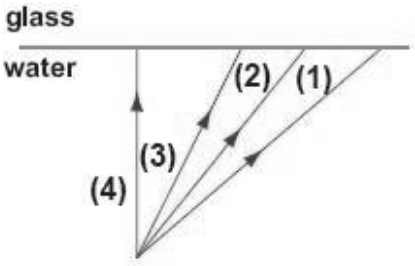
6- Calculate the absolute refractive index of diamond given that the speed of light in it =1.25x108 m/s.

7- From the opposite figure, find;

(a) Wavelength. (b) Frequency.
(c) Amplitude. (d) Wave velocity.



8- Complete the path of the light rays illustrated in the opposite figure given that the angle of incidence of the light ray (2) equal the critical angle.

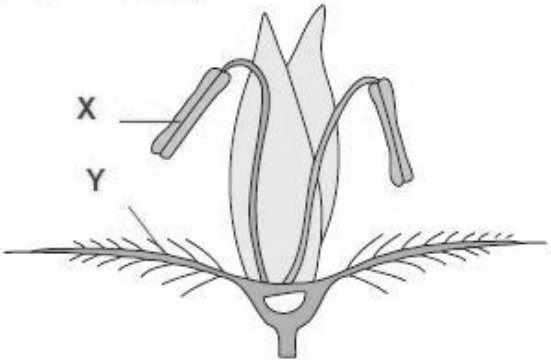


9- The opposite figure shows a flower being pollinated by wind (air):

(a) Write the labels for each of x and y.

(b) Mention two characteristics that make this flower pollinated by wind (air).

(c) Explain how cross pollination happens in this flower.



10- Study the following figure which represents the female genital system, then answer the following questions:

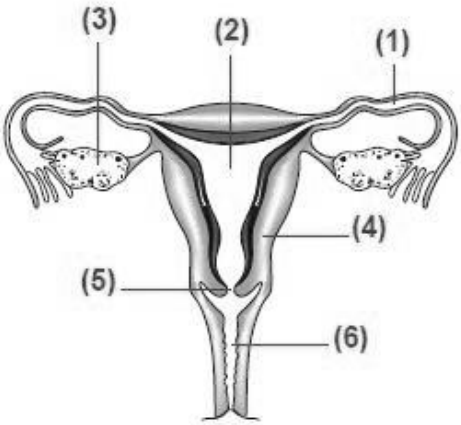
(a) Replace the numbers present on the figure by the suitable labels.

(b) What's the organ in which;

(i) Ova are produced.

(ii) The ovum is fertilized.

(iii) The embryo is delivered to life.



11- Choose from the column (b) and (c), what's suitable for column (a):

(a)	(b)	(c)
Floral whorl	**Consists of**	**Function**
1. Calyx	1. Stamen	1. Male organ in a flower.
2. Corolla	2. Sepals	2. Female organ in a flower.
3. Androecium	3. Crapels	3. Protects the inner parts of a flower.
4. Gynoecium	4. Petals	4. Attract insects to the colored leaves.

Wishing you all good luck
Mr. Mohamed